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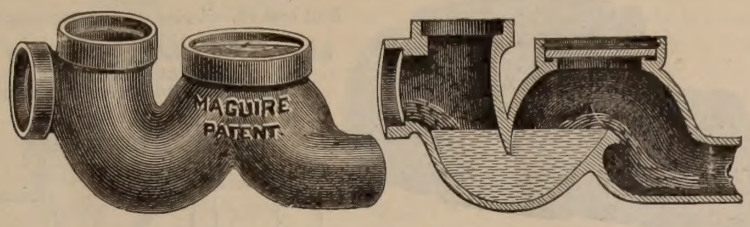

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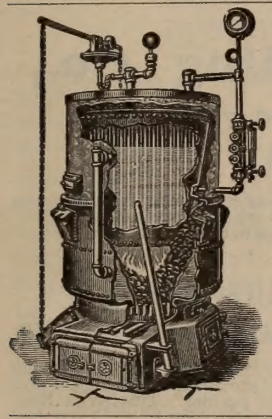

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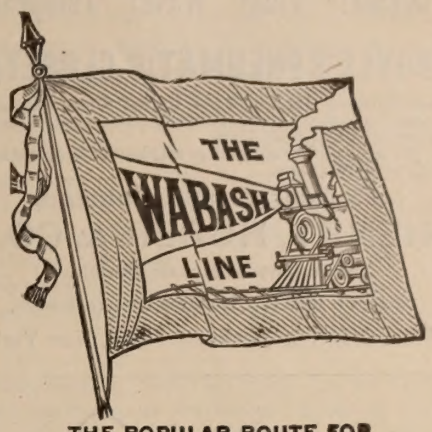

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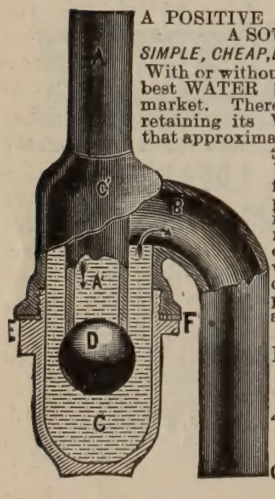

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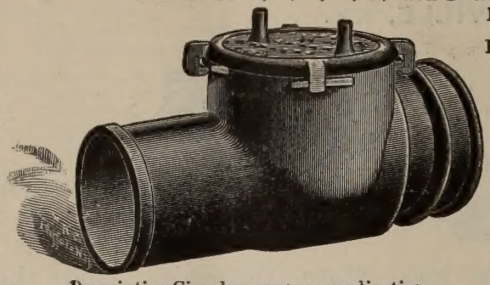

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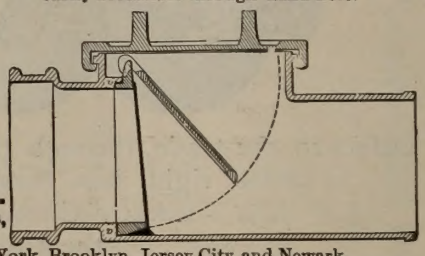

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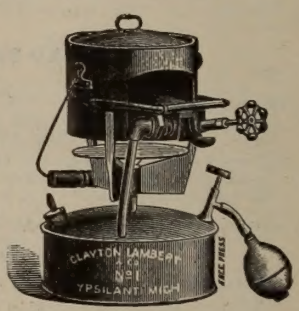

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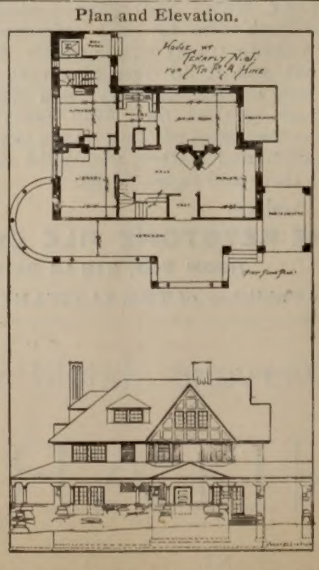

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The establishment of boards of health is a duty of the state that cannot be disregarded. Its full, complete and ample equipment is incumbent on the state administration, and should be liberally discharged as its first and most important duty. Yet this, when provided in the most complete and perfect way, does not relieve the individual of his personal obligations to society and his duty to the well-being of the community in which he resides. Every one should feel his obligation as a sanitary agent in promoting the cause of health and preventing the advance of disease. Health boards must have the support and loyalty of the citizen, if the highest purposes are to be realized. It will not do to leave everything to them, and disregard all obligations as an individual. Everything that goes to make up a perfect community is borne equally by the individual, and there is no exception to this in the matter of health.

Health boards could do a good service in the way of educating the people regarding health matters by sending out information and instructions relating to sanitation, as some are now doing. If quarterly and even annual reports, or monthly reports, could be so arranged, condensed and compiled that they could be distributed among the people, great good would result therefrom. Most of such reports are distributed among those who do not need them, other boards, physicians, etc. They do not reach the people who need them, and would profit by having read them. People have faith in their health boards, but to too great an extent are they ignorant of the service they perform or of the aid they are capable of giving directly to the individual. The great need of the people now is education in sanitary matters and the knowledge of their importance.

There is nothing in or about a dwelling which can so injuriously affect its sanitary condition as plumbing. There is nothing in or about a house that can so materially add to its healthfulness as plumbing. It can make a home utterly ruinous to health, or it can protect the family from disease. This important fact establishes at once the true value of a properly qualified plumber. It marks plainly the duty of the building-owner to himself and to his fellow-men. There is nothing hypothetical or uncertain about it. It is plain, simple and sure. It is to secure good plumbing. How? There is no how about this, nothing difficult. Employ a reputable plumber. There are plenty of them. There are good men you employ in everything; so there are in plumbing. They have that reputation where they are known. They are reliable and trustworthy. They are not hard to find. Inquire for them and they will be pointed out. Employ them and the whole thing is done.

In another column is an article on Ventilation, in which the matter of breathing "night air" is mentioned. This brings to mind the many admonitions heard regarding "staying out in the night air," "breathing night air," etc. Probably ninety-nine persons out of every hundred have been cautioned against breathing night air. Well, what is to be done? We have to breathe, and if we do not breathe night air, what on earth will we breathe during the night? The trouble is, we do not breathe enough night air. In cold weather especially we shut up our rooms and breathe the air therein over and over and over again, when we should be breathing good, pure, fresh night air. There is a story told of an old lady who ruined her bread with salt, by not putting any in it. So do we injure ourselves with night air, by not breathing enough of it. If the air about a habitation is bad at night, there are not wanting reasons for suspecting it in the day-time.

If the plumber does not understand plumbing, who does? He has learned his trade, had all the experience there can be obtained in it, and is the only one who can do the work. You would not think of going to a silversmith to have your plumbing done; you go straight to a plumber. You know that is his business, and that no other person understands it or can do the work. It is also reasonable and logical to conclude that if a plumber can do plumbing work, he understands it, is learned in that regard, and has practice, experience and qualification. Then why is he not the proper person to seek advice from regarding the plumbing of a house, as to its sanitary condition? Why is he not the proper person to call in to examine the plumbing when it is suspected of being out of order? When you wish to purchase or lease a residence, why is not the plumber the proper one to advise you regarding its sanitary condition? When you wish to purchase a house, you do not go to a preacher or doctor for advice regarding the soundness of the title, but you go to a lawyer. Whenever you suspect a defect in the title of your prospective or immediate possessions, you go to an attorney for advice and information regarding this important matter. Your health is of more importance to you than your possessions. The sanitary condition of your dwelling is of greater value to you than the title of it. It is well to have a sound title, but it is better to have a healthful house. Fortunately, you are not confined to either one or the other. You may have both. It is your right and duty to possess both, and the question is, if you go to the lawyer to secure the one, why do you not go to the plumber to secure the other? Why not be consistent and sensible?

The Committee on Medical Legislation of the Texas State Medical Association have prepared and sent out an address to the medical fraternity of that state, making a strong appeal for the establishment by the state of a system of preventive medicine. This is an important move on the part of the physicians of that great state. Texas is too great and progressive in all other directions to be be behind in this. Other states to the number of thirty-five have health boards, and are continually perfecting their state systems of health. Two years ago, Florida called a special term of the Legislature for the purpose of establishing a board of health, and enacting laws necessary to its efficiency. Texas has a fine medical society, and its members are now at work in the right direction to bring their society and state to the front in matters of sanitation, in establishing a state board of health and enacting laws to govern the practice of medicine.

Among others, the law desired would embody the following features:

1. The State Board of Health, composed of physicians nominated by the State Association and appointed by the Governor, shall constitute a Board of Examiners, before whom all persons intending to practice medicine or any of its branches, except dentistry, in the state, shall present themselves for examination.

2. A general register of the legally qualified practitioners of medicine and surgery of the State of Texas, of which the State Board of Health shall be the custodian. This register shall be open to all who at the date of the passage of the law shall have qualified under the laws now or heretofore in force, and to those qualifying by examination under the new law.

3. Any one claiming to practice medicine, whose name is not borne on the register, shall not be competent to recover at law payment for medical services; he shall not be exempt from military and jury duty; he shall not be admitted to give expert testimony in any court of law, or to give a medical certificate to be used in litigation; he shall not be eligible to any medical appointment, state, county or municipal, or as a medical examiner for any life-insurance or benefit society doing business in the state; and he shall be subject to punishment by fine or imprisonment, or both, for illegal practice of medicine, on conviction thereof in a court of competent jurisdiction.

NOTES AND NEWS.

A new usage has been discovered in Havana for electricity. It is said to be a successful agent for the purification of sugar.

Captain Williams, of Jeffersonville, Pa., twenty years blind, is recovering his sight. He thinks the glare in his room of an electric light has something to do with his recovery.

Cyanide of gold is said to be the substance used by Koch in his experiments to prevent the development of the tubercle bacillus in Guinea-pigs.

India is to have an industrial and sanitary exhibition of municipal appliances in the cold season of 1891. Mr. A. W. Hughes, supervising engineer municipal water-works, northwestern province of Oude, can furnish all particulars.

At a recent social meeting of the Jenkins Medical Society at Mt. Vernon, N. Y., there was a base-ball match between the Qui-Nines of that town and the Strych-Nines of Yonkers.

A severe epidemic of what is believed to a peculiarly virulent form of diphtheria is said to be prevalent in the fishing towns of the French shore of Newfoundland.

It is stated that, in compliance with the public wish, a horse-meat restaurant has been established at Berlin, wherein a large trade is carried on.

The Pathological Institute at Berlin is too small for its collection and needs, and Virchow is trying to get an addition or a new building.

Several cases of small-pox have been reported at Locust Point, due, it is said, to the laxity of the quarantine station.

A pleasant household deodorizer is made by pouring spirits of lavender over lumps of bicarbonate of ammonia.

The Russian government has dispatched several doctors to Asia Minor to test, by experiment, the treatment of cholera with the Feruba Sumbul—a plant which grows in Turkestan, and possesses anti-spasmodic properties.

To make a clear, almost odorless, and permanent mucilage, Francke neutralizes the free acid present in the gum with lime-water. Instead of water he uses a mixture, 20 per eent. lime-water and 80 per cent. distilled water,

Incandescent lamps placed near the ceiling will cause it to blacken, contrary to general belief. The blackening is due to a current of hot air which deposits black particles on contact with a cold surface.

Sixty-five years ago Emmons Rudge was arrested in Hartford, Conn., for selling ice, as the doctors had decided that it was unwholesome.

With the view of checking the adulteration of food, the municipal authorities of Rome have recently passed an enactment that the names of all makers and vendors of alimentary substances injurious or dangerous to health, or adulterated, shall be published in the daily papers.

It is said a good cement for joining parts of apparatuses, etc., permanently solid and water-proof, and which resists heat, oils and acids, is made by mixing concentrated sirupous glycerine with finely-powdered litharge to a thick, viscid paste, which is applied like gypsum. Glass, metal and wood can be cemented together by it.—*Scientific American.*

At the meeting of the Church Congress, held in Hull, England, the first week in October, the social aspects of sanitation was one of the subjects discussed, and the following programme adopted: Acquaintance with and obedience to sanitary laws a Christian duty; present condition of laborers' and artisans' dwellings in view of recent and proposed legislation.

A daily paper calls attention to the fact that fiction has again been grafted on medical science. Announcement is made of a book in England in which the cheerful subject of "Diseases of the Liver" is worked into a "pleasant vein of fiction, thus combining useful knowledge on an important subject with all the charm of romance," as the prospectus puts it.

The late International Congress was attended by 8,831 persons, made up as follows: Germans, 5,561; ladies, 1,379; non-medical, 116; Americans, 623; English, 353; French, 171; Italians, 140; Russians, 471; Turks, 12: Portuguese, 5.

Dr. Turton, chairman of the Sanitary Committee of the Brighton Town Council, read a paper on "Some Points in Relation to Septic and Infectious Diseases," in which he said that all collections of putrescent organic matters were equally capable of producing symptoms of septic poisoning, though the putrefaction of sewage was, for obvious reasons, by far the commonest cause of such poisoning.

This is the way it is stated in Baltimore by the *Medical and Surgical Record:* A recent stroll through the city hall on election day showed a very small attendauce of employes in many of the departments, while the Health Department was going on as usual. From the appearance of things, election day makes no difference to the Health Department.

The Medical Department of the Russian Ministry of War has decided to establish movable laboratories of toxicological chemistry and bacteriology attached to each army corps. In these laboratories all food supplied to the troops will be analyzed.

At a recent meeting of the Odessa Town Council a resolution was introduced demanding that all local dealers in old clothes should be permitted to sell their articles only after a thorough disinfection in the town disinfecting chamber. Every piece subjected to the treatment to be furnished with some mark, without which no article should be sold.

The *Lancet,* referring to the recent experiments of Brown-Sequard in condensing the organic matter of the breath and determining the degree of its poisonousness, says that "it is quite probable that a man excretes from his skin and lungs in twenty-four hours more poison, though in a more diluted form, than a snake manufactures in the same time."

The next meeting of the American Public Health Association will be held at Charleston, S. C. It will convene December 16th. The sessions will be continued for four days. Among the topics announced are those of sanitary house-construction in its various details, the disposal of sewage, isolation of hospitals for infectious

and contagious diseases, maritime sanitation at ports of entry, the restriction of tuberculosis, etc.

The Russian Medical Department has issued an order that druggists are on no account to dispense medicines on the prescription of dentists.

The prevalence of typhoid fever in New York and Brooklyn during the present season has led Dr. Cyrus Edson, of the local Board of Health, to make an exhaustive examination as to the origin of the disease in as many cases as possible. He found that the disease, in nearly one-half the cases inquired into, was contracted in country resorts to which the victims had gone to find health.

Twenty years ago the average annual mortality in Edinburgh was 25.85 per 1,000 of population, zymotic diseases being credited with 17.98 of this. The present mortality (1879 to 1886) is 19.04 per 1,000, only 11.9 of this being due to zymotic diseases. This means an extension of the average length of life from less than 40 to over 50 years, and a diminution of fully one-third in the mortality from infectious and contagious diseases. In Liverpool the influence of attention to sanitary conditions is shown in the decrease during the ten years past in the deaths from fevers from 23 to 10.8, and in deaths from diarrhœa from 32 to 21.4.

Attention has lately been called by Dr. Lindley to the therapeutic value of regions below the sea-level, for asthmatical or consumptive patients, who there have continuously higher atmospheric pressure than at the sea-level. Excellent effects have been thus obtained in the valley of Conchilla, near Los Angeles, in California, about 273 feet under the sea (barometric pressure only about 7 mm. higher). The most noteworthy place of the kind on the earth's surface is probably the Dead Sea district (1,289 feet), and the following are some others: Lake Asal in East Africa (639 feet, the oasis of Araj in the desert of Lybia (270 feet), the Arroyo del Muerto in California (230 feet), the oasis of Siwah in Lybia (123 feet), the borders of the Caspian (86 feet).

WILL GENERAL SANITATION EVER BECOME POPULAR?*

What we mean is, will those laws that secure good health, long life, and a vigorous physical and mental condition be cheerfully learned and practiced?

In other words, will that branch of medicine known as preventative medicine, which can be learned and practiced by all laymen, be acquired and utilized?

It would seem natural to answer this in the affirmative when we call attention to the deadily epidemic known as the plague that visited Russia, Germany, Italy, England, and all nations in Europe, taking its hundreds of millions of victims in the aggregate; Hecker telling us that this disease alone swept from the earth 25,000,000 of people from the years 1347 to 1351. London alone having lost by it 100,000 a month, Venice the same, Paris 50,000, Avignon 60,000 in the same time, and it is believed that in England not one-tenth of her population escaped from this cause.

By the observance of the simplest sanitary injunctions this plague was barred from entering one nation after another, until the doors of all are now closed against it, and it has perished as a pestilence and a terror from the face of all civilized nations, and is not known to any of them even by name.

We can point to the visitations of cholera in France, Russia, Germany and England, and show that in the years 1831–32 the number of victims went up into the millions; but when this same disease visited these same countries, in 1873, so well was it understood, that its fangs were extracted just as civilization advanced.

In England it did not even attain the importance of an endemic.

We can turn to our own country and look at the condition of things in 1831–32, and note the incalculable ruin it wrought to life and industries; but pointing again to the same disease when it visited us in the years 1834-66, we see that its march was like that of a lion, paralyzed, with fangs extracted, all along the eastern part of our country, for the laws of preventive medicine were respected. The filthy South and West alone suffered severely.

The typical filthy city of America is New Orleans.

Cholera visited it and the Mississippi River in the years 1832-34-48-60, gathering, as usual, a large number of victims, while the good sanitary condition of the East secured for her complete safety. Yellow fever has appeared in our country and the West Indies 180 times. It is safe to say that the South never escaped, and this disease continued to harvest its victims in it without opposition until the year 1863, when both General Butler and it started for New Orleans.

The General reached there first, bringing with him all the elements, both of yellow fever and cholers, in the large bodies of men with the indispensable host of camp-followers, who are entirely irresponsible in their habits of life; and added to those the vast numbers found in the city, depressed in body and mind by poor and scanty food and fright; people who were too ignorant, too poor, and too helpless to get away from it, and added to this the vast number of animals indispensable in the movement of large bodies; and to complete the above unfavorable conditions, the reeking filth and loathsome condition of this city with the germs of this disease that had never left this old camping ground. What was there now wanting to generate a cyclone of death equal to that which ever visited any country?

While that city was held in the grip of General Butler, he, in turn, yielded ready obedience to his sanitary engineers, sanitary inspectors and medical officers, aiding them with just such an intelligent, earnest and ample force as they needed to carry out in a prompt and effective manner all plans for the securing of cleanliness.

So marked was the immunity from disease that not only were the eyes of all people cast upon it, but to this day it has been spared from both epidemics. How largely this single factor entered into the solution of the greatest governmental question of all time can be realized by all who have witnessed an epidemic in a ctowded city.

The problem of self-government is watched by all intelligent, liberty-loving people upon the globe, and their eyes are all upon us, as we are the only example of a powerful people governing themselves voluntarily.

Suppose yellow fever and cholera had attacked our armies as pestilential diseases did large bodies of men of old. Where would have been the republic we to-day enjoy?

We can point to Memphis in 1879, with its yellow fever scourge.

There is not a city in our country we cannot point to for proof of the profit and vital importance of observing the laws of preventive medicine.

I shall cite a few extracts from the pen of that classical lay writer, Charles Dudley Warner, who in writing of our great West, as he saw it, says of the city of Memphis: "The student of social science will find in the history of Memphis a striking illustration of the relation of sanitary and business conditions to order and morality. In 1878 the yellow fever came as an epidemic, and so increased in '79 as to nearly depopulate the city; its population was reduced from 40,000 to about 14,000, two-thirds negroes. Its commerce was absolutely cut off; its manufactures were suspended; it was bankrupt. The turning point in its career was the adoption of a system of drainage and sewerage which immediately transformed it into a fairly healthful city. The inhabitants were relieved from the apprehension of the return of a yellow fever epidemic.

"Population and business returned with this sense of security and it can now truthfully claim between 75,000 and 80,000." In practical sanitary reform, England first started, and is still in the lead, and she has no city which has profited more by it than her great manufacturing city, Manchester, with her more than half million people. Her sanitary records show that for all expenses of every kind, $435,000 were paid out in one year and for this, the actual saving of life was 2,301, about 1,000 of them between 20 and 70—or a gain of $1,000,000, at the rate of $1,000 per person; add to this the saving for funeral expenses, about $75,000, and gain of $250,000, that would have been spent in the treatment of 103,000 citizens preserved from sickness, and another $250,000 for the wages they must have earned; and then, at a very moderate computation, we have a gain of more than $1,500,000, to be set against the expenditure of $435,000—not including the bodily suffering of the sick, and the mental distress of the friends.

*Delivered by Dr. John McCurdy, of Youngstown, before the seventh annual meeting of the Ohio State Sanitary Association at Dayton.

Professor Pettenkofer, of Munich, Germany, has made careful estimates of the German cities with about the same showing. New York, in our country, is the great sewer into which is poured, more than any single city, the scum and slush of Europe and the West Indies, in addition to her own; and although, invaded by every form of pestilence, nearly every day in the year, her health department has demonstrated again and again its ability to starve or stamp it out, till now every family and individual feels that nothing can molest or make them afraid; although before her health department was organized, one case would put "a thousand and two, ten thousand to flight."

It would seem, from what has been said, that the people would cheerfully respond and be eager to enforce sanitation, but exactly the opposite is true.

The city does not exist upon the globe to-day with a sense of cleanliness strong enough to keep herself clean voluntarily. The determination and deadly resistence between the health department and the great bulk of the people, corporations and many manufacturers is as deep and desperate as that displayed at the battle of Gettysburg. People will not keep clean. The natural bent of human nature is to filth and poverty, and the virtue of personal and property cleanliness, like all others, is secured by hard and persistent effort; by driving up-hill the vice, ignorance, laziness and poverty that stand in the way. The refined, the educated, the self-respecting and the enterprising only are the friends of cleanliness. The advocates of protective medicine show facts clear and strong as the sunlight in the protective powers of vaccination, but it avails not. In Paris, where vaccination is lax, there are yearly ten deaths to each 100,000 inhabitants; and in Zurich, where the mortality was 8, in 100,000, the vaccination ordinance was repealed, and at once the deaths rose to 85 per 100,000. Then look across to Germany, where it is enforced by law, and in the face of all those elements so productive of contagious diseases as large standing armies and immense numbers of poor—there is not ½ of one to the 100,000; and in London, where the law is rigidly enforced, there is only 6-10ths of one to 100,000, and this, too, in the face of poverty, squalor, vice, ignorance and filth. Yet in all the latter countries the enemies of vaccination are so numerous, fierce and persistent, that they are organized and expend large sums of money trying to defy the law and have it obliterated. We point them to Germany, England and France and the United States, and show them the lives lost, and the fabulous sums of money filth costs in disease, and still every city and town presents an army of determined opposition to preventive measures. We hold the figures up before their eyes, and show them that on the beggarly basis of valuing a life at $750, we lose $500,000,000 a year; that we lose more than 250,000 citizens from strictly preventable diseases, and that with scarcely an exception, in every town, each inhabitant would be taxed at least $8 per head for its filth and sanitary neglect.

Yet in what community has not the election of officers been fought on the sanitary issue—and where is the place where people, not only of ignorance and narrowness, but even the so-called cultured do not keep in open rebellion on all preventive measures?

We can point to our opponents, and show them that in a city like Boston the mortality from preventable diseases was 34 per cent. of the whole, and then by but moderate cleanliness it was reduced to 18 per cent., and kept at that as long as wished. Yet the people of Philadelphia not only insist on being dirty, and drinking water that has been shown to be directly destructive to human life, but they will break open the pumps and hydrants, and defiantly drink said water, and discharge the officials who dare oppose them; and this sort of mob is headed by a person no less than the so-called honorable Mayor.

We can point to Plymouth and Bellaire, towns in vast numbers, and trace for our opponents the course and cause of typhoid fever and diphtheria as clearly as a mountain brook is traced, and still their self-induced blindness will not recognize it, and they meet us with a destructive crusher that we are but "sanitary cranks,"—that sewer gas does not kill, for they and their forefathers breathed it, and it did not kill them; that the water is not foul; the analysis matters not to them, as they use the water and are in good health; that their cellars, yards, and compost heaps do not produce diphtheria or scarlet fever as they have not had either of them.

It matters not what is said, they meet us with the logic that the Irishman did the sanitary officer, who told Pat that the pig and its pen, which were at his door, must be removed. "And what for?" said Pat. "Because it is unhealthy," said the officer. "Oh," says Pat, "that is not so, for that pig has been there for more that three months, and never cleaned, and he has not had a day's sickness."

It is with sanitation as all other vital reforms; it requires a complete change of heart, and a veifying of scripture, "precept upon precept, line upon line—here a little and there a little."

This may be our last session, but the fact remains, our work is imperative and vital, and life, self-respect, prosperity, and progress all urge us on. Open your eyes to the actual facts in our great State of Ohio, with her three million of people, and see the mortality that attends her preventable epidemics, and yet what has she given the State Board of Health for our protection? The beggarly sum of $5,000, not enough for the oversight of a single county.

Our work is not more nearly done as an organization in looking after the physical, social, hygienic, and vital welfare of our people than is the work of our teachers who look after the spiritual and educational welfere of the people. As long as the mind of man creates, and the heart of man harbors impure thoughts, as long as avarice, selfishness, greed and disregard for the feelings and welfare of others exhists, as long as "man's inhumanity to man makes countless millions mourn," there will be animperative need for organizations of this kind, for general sanitation will never become popular.

SANITARY INSPECTION.

Commissioner of Health, George H. Rhoe, of Baltimore, has issued the following instructions to his sanitary inspectors:

Sanitary Inspectors will, at the time of making inspections, give such cautions and instructions to the householder as will tend to restrict the spread of the disease. Especial stress will be laid upon the importance of separating the patients from the healthy members of the family and of preventing unnecessary intercourse with other persons than those needed in the care of the sick.

In addition to making a careful sanitary inspection of the house and surroundings, the inspector will request the nurse or other person in charge of the patient to promptly put all soiled clothing, bed linen, handkerchiefs, napkins, towels, etc., *into boiling water*. This at once destroys all disease-germs. Table utensils, tumblers, etc., should also be scalded immediately after use and wiped with a *clean* towel. Spittoons or other receptacles for matter expectorated should be partly filled with a disinfectant solution of phenyle. This is especially important in diphtheria and scarlet fever.

In cases of typhoid fever all discharges from the bowels should be received in a vessel containing about a quart of the phenyle solution, or if a bed-pan is used, this should be immediately placed in a vessel of the disinfectant solution, or of boiling water.

The inspector will note upon a special blank the date of recovery or death of a patient from an infectious disease, so that proper disinfection may be carried out by the department.

When a house is reported ready for disinfection, the disinfector will proceed to the house with a supply of sulphur and a fumigator, and fumigate the room formerly occupied by the patient. All articles remaining in the room while occupied by the patient should be allowed to remain until after fumigation. Three pounds of sulphur should be used for every 1,000 cubic feet of space in the room. (A room 10 feet long, 10 feet wide and 10 feet high contains 1,000 cubic feet.) All windows and doors should be closed as tightly as possible, any cracks, crevices or other openings being stuffed with rags, pasted with paper, or in some other way made as nearly impervious as possible to the entrance of air, or the escape of the sulphur fumes. The room should be kept closed for 24 hours, when the windows may be opened and the room exposed to the air as freely as possible for 24 hours longer. The articles in the room, bedding, clothing, etc., should be spread out

on chairs, etc., to allow the sulphur to act on all surfaces possibly infected. Carpets should not be taken up until after disinfection, unless they can be removed at the very beginning of the case.

After the fumigation all washable articles should be washed in boiling water, and furniture, floors, etc., scrubbed with hot water and soap.

Articles of little value should be burnt. Walls, ceilings, etc., should, where practicable, be whitewashed.

Officers of the Health Department are not allowed to make any suggestions or comments upon the medical treatment of cases, or indulge in any criticisms of the attending physicians.

Disinfecting solution of phenyle may be made by thoroughly mixing *one tea-cup* full of Little's Soluble Phenyle with one gal lon of water.

WINTER VENTILATION AND THE MARCH DEATH-RATE.

In this temperate climate, says the Canada *Health Journal*, the dwelling houses are all closed up about this season of the year, for the winter, and in most cases with double windows. Many thousands of people, indeed a large majority of the people, are closed up in the dwellings, or in shops or offices, and from this until April or May breathe but little of the pure, fresh, invigorating outer air, but breathe daily, over and over again, the same, often overheated, atmosphere of the closed rooms. The consequence is that in March and the early part of April—just when the beautiful cheery spring has already broken up the winter frosts and almost everything in nature is full of vigorous life—we have in Canada, every year, as shown by statistics year after year, the highest death-rate of the year, in all ages and classes, with the most sickness, especially lung diseases, "colds," &c. There is no doubt whatever about the relation of cause and effect in this matter. The debilitating effect of breathing and rebreathing the same foul air of closed rooms for a few months renders the human system an easy prey to disease of various sorts, and more especially to disease of the respiratory organs which are so directly affected by the foul, over-warmed air of the rooms. The wonder is that so many can tolerate the foul air and that so many survive. This can only be explained by the well-known power of the human organism to suit itself in a large measure to circumstances and environment. Night and day the foul air breathing goes on. While some get a respite for an hour or two a day in the open air, many, as of the women and children, but rarely go out at all. And as the *British Medical Journal* (of Sept. 27, '90) puts it, whilst the importance of keeping pure the air of living-rooms during the day is recognized by a large majority of the educated classes at the present time, it is to be feared that there are still very many who by preference sleep at night in closely shut bed-rooms. "The conviction that night air is unwholesome and should be rigidly excluded, once so prevalent, probably now only survives amongst the unlettered and ignorant. It doubless had its origin in times when undrained swamps and malaria-breeding mists, arising at nightfall, were characteristic of large tracts of rural England, and thus the survival of a belief founded more or less on the results of observation and experience; but at the present day it cannot be too strongly asserted that . . . night air is as wholesome as that of the day, and may even be said to be purer, as it is more free from dust and spores raised from the ground by winds, human traffic and evaporation. The occupation of close bed-rooms, the *Journal* continues, putting it very mildly, creates an atmosphere often sufficiently vitiated to cause weariness and drowsiness in the early morning, instead of that feeling of renewed life and vigor that should be experienced, and much of the headache and neuralgia so constantly met with may be reasonably credited to the same cause. If anyone will take the trouble to return to his shut up bed-room after spending ten minutes in the fresh morning air outside, he will be surprised to find how close and disagreeable is the atmosphere in which he has spent the last eight or nine hours.

What is the remedy? Ventilate—provide means for letting out or drawing off the once breathed, foul air and letting in the pure and fresh. It is a very simple process. It costs a trifle to be sure to warm the fresh cold air from out of doors, but as we have said repeatedly on former occasions it is better to pay a fuel bill for warming pure air than either a "butcher's" or a "doctor's bill." Provide at once an opening through the wall of every occupied room into a chimney flue that will be usually warm, or cut an opening into a stove pipe, if one pass through the room. This will draw off the foul air. Even if you use a grate or open fire, such an opening into the chimney above the grate will be very useful. If you have but one fire, probably a stove in the dwelling, have a good sized opening (say 4 by 6 inches) cut in the pipe, with a sliding door to partly close it in very cold weather when you have on a large fire. In many houses in severely cold weather, with this outward draft creating a vacuum within, enough pure air will come in through the cracks and crevices about windows, doors, etc. Often a window should be opened a little too. This is not a first-class method of ventilating, but if it alone were commonly practiced, it would prevent a vast amount of sickness and save very many lives. When there are outer or storm windows, have them so arranged as to open wide (the so-called small "ventilator" in the lower bar of the sash is hardly worth naming or using) and open all doors and windows once a day and flush the rooms. Do this for just a minute or two, or longer, daily, when the fires are good and walls all warm, and little or no discomfort will be felt even by an infant. Whatever you do, get the fresh air to breathe constantly in some way.

THE SECRET OF CHEAP BUILDING.

A man who is resolved to be independent of landlords can build a very comfortable house for from $2,000 to $2,500. He can have sufficient room, and a house with a decent exterior and a plain interior. He ought, first and foremost, provide a bath-room, even if he cannot buy a slate mantel. It will be wisest in the long run to have a bath-room. Ask any woman who has had the care of two or three children, how much a bath-room saves them. The larger the family the greater the saving in work and worry—which is more wearing than work. If a man has only $2,000 and a large family, he must sacrifice something, or deny himself something, when he builds. If he is wise, he will contrive closets and cupboards, a style of house that renders running up and down stairs unnecessary (there is nothing so tiresome as going up and down stairs), make his dining-room large enough for a living-room, and see that the arrangement of the kitchen is labor-saving. Slate roof, slate mantles, bay windows, and pretty trimmings can all be dispensed with. There are people who do not seem to have any clear idea of the things that are appropriate in a cheap house. We recall an instance where a gentleman, after looking at a design for a cheap house, expressed surprise at the cost, which was very low, and in the same breath he enquired if it was roofed with slate. A cheap house is not roofed with slate, it is needless to add. His next query had reference to the plumbing. If his ideas were realized the plumber would charge at least $300. Evidently the gentleman thought the plumbing would cost about a third of that sum, or less.

To sum it all up, have substantial fixtures rather than pretty trimming. Good ventilation, ample room, plenty of light and warmth, may be obtained if a man desires to insure it in building for his own use, at a very moderate outlay. But then he must build to please himself, instead of vying with his neighbors.—*The Manufacturer and Builder.*

NON-CONDUCTING COVERINGS FOR HOT WATER PIPES AND RESERVOIRS.

In a series of articles being published in the London *Builder* on hot water supply, the following is furnished regarding coverings for pipes and reservoirs for saving heat:

"It is no exaggeration to say that very shortly no apparatus for hot water supply will be considered complete or finished if the whole system is not insulated, so to speak, so that almost every particle of heat absorbed by the water in the boiler will be obtainable from the taps, instead of nearly 50 per cent of it being radiated from exposed surfaces, and worse than wasted.

There are at this moment hundreds, if not thousands, of hot water systems that, by being carefully covered, would be converted from miserably inefficient to highly satisfactory appliances—this in particular with the tank system, when the tank is so commonly fixed in a cold, draughty roof.

An interesting instance of the success attending the covering of pipes occurred quite recently, in which a residence was fitted

with a complete system of hot water supply pipes on a scale sufficiently large for a good boiler in a 5-foot kitchen range, but owing to a delay experienced in obtaining the range in question, another of a smaller size, 3 feet, was fitted up and connected to the chimney and circulating pipes for temporary cooking and hot water supply. It was not supposed that this little range with its boiler would do much in the way of water heating, but to the astonishment of everyone it gave a really abundant supply of very hot water in every part of the house as quickly in the morning and altogether as satisfactorily as a larger range would be expected to do.

This desirable result was wholly brought about by the pipes and cylinder being everywhere carefully covered with a sufficient thickness of felt. It really does seem opposed to all reasonable and workmanlike principles to allow such abundant opportunity for heat to be thrown away, while labor and fuel is being expended in the kitchen apparently for this object. The waste of heat is not always the only ill result experienced, as in many instances the warmed air is very objectionable, and if a hot water pipe is carried alongside a soil pipe it is possible for a very unpleasant feature to introduce itself. It is a very customary practice for a hot water fitter to carry his pipes up in the casing that is nearly always to be found passing from the bottom to the top of the house, this casing containing all the different pipes of the house, such as the cold service from the main, the cold service down from cistern, the water closet cold water services, and, very commonly, the soil pipe. There is no objection to his making use of the casing if it is large enough to hold a few more pipes, and it is often used of necessity, as to carry pipes openly through well decorated rooms is out of the question; but to carry hot water pipes up this case without felting them is an exceedingly bad practice, as they are not only brought into contact with very cold surfaces (they have frequently been found wired on to cold pipes, four or five pipes in a bundle), but the heat radiated causes a draught or current of air to set in, as we find in a chimney.

When a casing contains pipes that radiate heat, that casing, within a few moments after heat is felt within it, is converted into a flue, as by applying heat to air it can be made to circulate to all intents and purposes like water. Air that is brought in contact with heated surfaces becomes heated and rarefied, and, thus being made lighter than the surrounding air, rises, and cold particles immediately flow in to take its place, they becoming heated and following the first particles, and so on, so that it resolves itself into a stream of warm air flowing out of the upper part of the casing, and cold air flowing in in corresponding volume below. This may be excellent in practice when hot water pipes are used for effecting ventilation; but it is fatal to hot water services, which are particularly required to keep the heat within them; in many instances they are cooled at about the same speed as they would be if placed outdoors when a strong wind was blowing.

It may be argued that if the casing is stopped off at its two extremities the trouble will be obviated; and so it would be if the casing was perfectly air-tight everywhere, and had no cold pipes within it. But this is never the case; there are always numbers of crevices and apertures which permit of a tolerably free ingress and egress of air.

The best material for covering these pipes, and also the reservoirs, is hair felt; hair is a natural poor conductor of heat, and nothing surpasses it for this purpose, especially as it is so easy of application. This felt, which is readily obtainable in sheets, is usually cut up in strips for pipe work; the strips are wound upon the pipe spirally, being secured here and there with cord or wire, but where spiral winding is impossible it can be tied on in lengths, which answers equally well, but has not such a good appearance.

The best and most complete arrangement for pipe work, but which entails a little greater expense, is to have the felt wound on spirally in one direction, say from left to right, and well secured with cord; then cover this with good canvas, also wound on, but in the opposite direction, and this secured with wire.

It is most necessary, to secure the best results, to have the felt thick enough; hair-felt is sold in great quantities about 3-16-inch thich, but this is not thick enough for good work. If possible, have it ½-inch thick, and a marked benefit will be had by using even thicker than this, or, say, two thicknesses of ⅜-inch.

In felting cylinders, it is the best plan to take sufficient sheets of felt, and then sew the edges together to form one sheet large enough to go all round the reservoir. This sheet can then best be secured by bands of hoop iron or brass passed round the top and bottom, and around the middle; these bands being tightened up by having a bolt to draw the two ends together. After this circular pieces can be cut for top and bottom, these pieces being sewed on to the top and bottom edges of the large sheet. Tanks can be covered in exactly the same way.

Sometimes it is desired to encase the tank or cylinder with woodwork. This makes by far the neatest job, though more expensive, and it causes a little trouble should it be necessary to open the reservoir under some circumstances. If it is decided to have a casing it is very important that the space between the woodwork and the reservoir be well filled in with some poor conductor of heat, such as cow hair (plasterers' hair), slag wool, or even dry sawdust answers very well when the casing can be filled from the top. If the casing is not "packed," with something it would be much better to be without it, as it would have a current of cold air passing up through it the same as explained with the general pipe casing just referred to.

If the hot water service pipes are carried up through the house without entering the general pipe casing mentioned, and it is proposed to incase them for the sake of appearance, this casing must also be packed for the reasons explained, but this is freqoently neglected with the worst results, as the casing of pipes is frequently done for appearance sake only, the question of radiation not being considered.

Occasionally it is found practically impossible to carry the pipes up inside the house, in which case it becomes necessary to carry them outside. This is very objectionable, but where it cannot possibly be avoided the objections do not avail, but they must be guarded against. In the first place, the pipes must be incased, and the casing ought to be of fair size, so that 1½-inch of packing can be filled in between the woodwork and any of the pipes. The packing must fill the case tightly, and it is imperative that the casing be well and tightly secured to the wall, as should it get loose, the woodwork and the packing will come away from the pipes and leave them exposed.

When pipes are carried outside the packing is not only needed to prevent great waste of heat, but there is a danger to be guarded against in cold weather when the pipes are liable to be frozen and an explosion possibly ensue, as the only outlet for any steam that may be generated in the boiler is at the upper extremity of the expansion pipe, unless a safety valve is provided.

SEWER-GAS POISONING.*

Sewer-gas is a technical term suggested by one of its sources only. It is a compound product of the putrefaction of excrementitious or other organic matter emanating from a variety of sources, but chiefly from the neglected and unsealed wastepipes of houses connected with sewers or cesspools.

The prevalence of affections more or less due to sewer gas poisoning, at this season of the year, particularly among persons who have recently returned to their homes, which have been closed for some weeks or months during the summer, should serve to make people generally better acquainted with its nature and the indications of its presence.

Sewer-gas consists of common air, carbonic acid gas, sulphuretted hydrogen, ammonium sulphide, and sometimes free ammonia; and it frequently bears disease germs from filthy wastepipes and sewers, which are the favorite breeding places of such germs. Yet it is commonly odorless even when it is the most dangerous.

Sewer-gas ordinarily finds the easiest access to dwelling houses when the occupants are absent, or by the "spare" rooms—those which are, perhaps, the mosl efficiently and elegantly equipped with plumbing fixtures, but rarely used—because at such times and in such rooms, the water in the traps of the waste pipes evaporates and opens the way for the emanations from the putrefying filth in the waste pipes and the cesspool or sewer, with which the pipes communicate, to enter the apartment.

The indications of the presence of sewer-gas are commonly first made known by its effects on the comfort or health of per-

*A. N. Bell, M. D., in *The Sanitarian* for October, 1890.

sons exposed to it. Hence these effects may be justly regarded as the symptoms of poisoning by it; though, unfortunately, by ignorance or negligence, they are not often taken advantage of as suggestive indications of their cause.

The symptoms of sewer-gas poisoning, or the effects of sewer-gas as commonly recognized by those who limit the scope of their inquiries to the sick chamber—the *diseases*, more or less due to it, greatly vary in both variety and severity, proportional with the intensity of the exposure or the power of constitutional resistance on the part of the exposed, and hence, unfortunately, the relation of the effects to the cause are much less frequently recognized, even by physicians, than they should be. Named in the order of their relative frequency, approximately, they are about as follows:

General lassitude, unrefreshing sleep, uncomfortable heavy-headedness, morning headache, sticky saliva, bad taste in the mouth, poor appetite for breakfast, nausea on first rising, feebleness, pasty-furred tongue, "malaria," relaxed throat, elongated uvula, ulcerated tonsils, laryngitis, sticky and inflamed eyes, feverishness, disturbed sleep, "nervousness," dyspepsia, irregular action of the bowels and kidneys, diarrhœa, typhoid fever, diphtheria, erysipelas, puerperal-fever, pyæmia, septicæmia and *death*—the post-mortem sign—and this, if attributed to one of the infectious symptoms named (in communities where deaths from infectious diseases are required to be reported), is the only symptom recognized as being of sufficient importance to base inquiry upon. But death much more frequently occurs as the result of the non-infectious diseases due to sewer-gas poisoning than of the infectious, though the relations of the former to sewer-gas are rarely or never inquired into, either by the physician in attendance or the health authorities.

In cases of death, exclusively reported from infectious diseases, through the medium of sewer-gas, the post-mortem examination (of the premises) is commonly conducted by the sanitary inspector of the board of health, whose services in this direction are never otherwise called for; and the signs or symptoms in the premises revealed by his examination are apparently the only ones which medical pracittioners generally accept and boards of health appreciate. The symptoms in these cases are about as follows: Corpse; undertaker's paraphernalia; faint or qualmish odor on first entering the premises; chokage, or absence of traps under the wash-basins, water-closets, sinks, washtubs and main house-drain pipe, and absence of ventilation appliances; malodorous cellar; cellar water-closet; damp places in the walls, floors or pavements along or near the course of the waste-pipes; subsidence of floors; rat holes in or about the basement floor.

When the boards of health acquire such knowledge of, interest and pride in their service as to reverse the ordor of their work, by such an application of the duties of sanitary inspectors as will gain knowledge of and deal with the preventable causes of disease in anticipation of the issue, if allowed to proceed, instead of continuously waiting for and dealing with the fatal results; and medical practitioners have learned that the highest and most sacred obligation of their office, as well as the most successful exercise of it, consists in gaining knowledge of and eliminating the causes in conflict with health. The symptoms of sewer-gas poisoning and the material causes which give rise to it will rapidly wane and untimately cease to exist.

THE BUM AND BUMMING.

(A SENSIBLE TALK TO YOUNG MEN.)

Well, you're getting there Eli. That's it; get out in the world and get some of your corners roughed off and, then, maybe, when you get some brains in that noggin of yours, you will have a little sense. You left a good thing for a life in a box car, did you? Well, you know whose fault it was. You let Dennis picture to you the beautiful life traveling in "green line" sleepers in glowing colors, did you? I think now you have learned a good lesson, and it ought to last you all your days. I never bummed in my life, never had to go to a back door for a "hand out." Dennis says the "Dutchman don't like bummin'." I shouldn't think you would. You left a good thing that would have materialized in more benefit to you in a short time if you had had patience, than you could have an idea of. Think of Mrs. Lipscomb's well filled table and Whitsett's spring beds. I'm glad you went, both of you. You will learn something of life, and that "all's not gold that glitters." I would be ashamed, if I were you. Yes, ashamed of myself. You were recommended to me highly, and now what would your papa and mamma say if they could see you rough it in a box car and hitting the gritt? I tell you, "Gus," you have a great deal to learn yet. No doubt you have beautiful dreams of what you will achieve. In your mind's eye you see yourself coming home years from now in velvet and fine linen. I trust you will come that way but I fear your garments will be composed of burlaps. You expect to drive home in gorgeous equipage and Wagner sleeping cars. I hope you will not have to count ties and get turnips from hired men to keep soul and body together. You scoff now at the idea, and you may scoff from now until Gabriel blows his trumpet, that the cows are coming home. I have heard young men scoff at words spiced with wisdom before, and I have seen them driving street cars and sawing wood. The fact of the matter is, Gus, you have exaggerated your own importance in the world. You may foolishly exaggerate the idea that if you were to die to-night your passing away would stop the moon and stars and planets in their course. But it wouldn't. The sun would rise just the same. The stars would twinkle the same, old, inspired way. The rivers would flow on and on as placidly as ever. You would be laid nicely and tenderly away in a nice little grave, and the grass would grow over you, and the brunette cow would eat the grass, and there wouldn't be a single jolt in the world because of your passing away. It is unfortunate for you that you possess so much egotism and self-conscious pertinacity. When you have slept in box cars awhile you will want to go to some secluded graveyard and weep. You will be convinced that instead of knowing it all you haven't begun to suspect anything.

Man is like a ground hog in the path of a land slide, Gus. If the ground hog has sense enough to get out of the way it's all right, but if it cocks itself up on its hind legs, it will be eternally squelched. Man is also like a boulder on the sea shore in Harlem. The boulder may be a great deal bigger than the pebbles about it, but when thrown in the water it doesn't take any longer to cover it than it does one of the pebbles beside it. I knew a man once who could converse in more languages than you could shake a cord of wood at. What he didn't know about astronomy was not worth knowing. What he did not know about any science or art was not fit for cramming in his head. He had forgotten more than you or I ever will know about a common old dirty water closet or a sewer, and yet, it is to be regretted this superb man, this grand man, this hail fellow well met, perished in a little creek not ten feet wide, just because he had never learned to swim.

Go forth into the world boys, but not with the idea that you know it all. Try to convince yourselves that the rest of the world was not born yesterday. Don't think that you will be met at the train the same as Shakespeare or Bartholdi or Grant would be, for you must remember they did not hit the grit on green line sleepers. Don't think that the whole town will turn out and carry you around in fine carriages Don't think they will carry you lauded up to the very skies. The prodigal son was very "fly" when he left home, and you have learned long ere this how he returned in sackcloth and ashes. He went back on his uppers without enough to buy a bowl of soup at a fourth rate chop house in Baxter street or Five Points. Hundreds and thousands have done the same. I've had to hit it mighty hard sometimes, but I never bummed a mile on a railroad in my life. I always so far have ridden at least in a steerage or in a fourth rate car on a cushioned seat, and paid my way with honest U. S. money. Go forth unostentatiously, without any drum major business. If you are not immediately offered the presidency of a bank, go to work hoeing corn or sawing wood. The world is full of golden opportunities, but the young man, who is so mashed on his dignity that he has not eyes to see how to grasp those opportunities, is very liable to get left in this world hoeing corn or counting ties in the most deplorable and emphatic manner.

We all have our favorites. There are some boys and some men who, when shown a way to help an employer out, and at the same time put golden thoughts in the employer's head, turn their backs and say eight hours are enough, or he is a "fake," or he rushes his men. Not so with the willing hand. The upshoot of business now-a-days is the willing hand always gets the *soft snaps*,

while good men, good mechanics, get the ditch work. You can hardly do anything for the unwilling hand. He repels you. If he works at all he does it ungraciously. He has no interest in the job. He leaves this and that to go back. He reports his work tight, everything all "O. K." The collector goes to collect. He finds this joint sweating, that joint leaking, this check and waste leaking; this elbow split, that closet not made up to the coupling properly, that vent puttied in, this bend kinked, that trap unsealed, this and that and that and this out of kelter. He goes to the shop for new solder; says the solder he has is spoiled, that it cools too quick, that he can't wipe with it; its doffy, grainy. He is always kicking, always cussing his boss behind his back. He talks shop over saloon bars; keeps all the bar tenders posted in the town about this job and that job that the boss took too low. You dare not ask him to lift a hammer after the whistle has blown or he will ask for extra time. No, you either go and do it yourself, or think of your trusty Jim, the willing man, who is always willing to lend a hand in mud and rain, in snow and sleet, in sun or night. He is as spry as a cat, always willing, always ready, night or day. He knows the location of every stop cock, every valve, every sewer, every trap and every vent. He is apt, quick. He it is who never gets left. He never lets anything "get him." He it is who always has a piece of candle, a match, a piece of copper wire, a piece of packing, some washers, a few tips, a few burners, etc., in his outside top coat pocket, so that when he gets in a house to pack a bibb, and the lady wants something else done, he is always fixed. He doesn't have to have a cub trot two miles to the shop for this and that. He it is who gets his wages raised gradually until he gets to be a foreman. He always knows what to do with his solder if its zincy and will not spot. He has a little sulphur and a little arsenic to neutralize the sulphur, and a piece of rosin or tallow candle to clean up after the rosin, sulphur and arsenic. He it is who does not have to send the "kid" every ten minutes two miles to the shop for more tin. He studies his job well before he commences to cut his lead. He cuts eleven inches if it takes eleven inches, and does not send to the shop for nineteen and throw the rest in the alley. He teaches his helper always to pick up the grains of solder on the floor. These, he says, pay for his boss' cigars. Some men throw away and waste out of the back door more than an employer can bring in the front. The saving man we do not forget. He becomes dear to us. We do not forget this kind of a man.

It seems strange that all of us do not realize this more, for every one is in some one else's employ, and has sooner or later a chance to show the willing hand—as a giant woodbine lifts up a shoot, willing, strong and neighborly among its fellows. So can the shoot return the favor in many ways. It can prevent cormorants from ascending and knawing the employer's profits. It can protect the employer from needless mortification over a slip-shod careless employe's work. It can offer its own help to throw leaves of kindness around a customer's heart to the first batch of expletives that often strip a man of a paying business that he has put a life-long effort in to sustain. This is the kind of men who are always in demand, and the sooner the rising generation learn it the better bosses they will make when they get a shop of their own. How many men never get above a cellar business? They have no ambition to get out of the cellars. They get a few dollars, get a little credit and get some one to go their bond. They get a license and then set down and wait for Maccawber to turn something up. A deck of cards and a neighboring saloon get their first efforts. They do this job cheap to get this man's influence, thinking that now they have his work and he owns this house and that store and that block down town, they have him solid. Well, you haven't. Does not he know you are after getting even? Of course he does, and instead of letting you have the next job, he hunts up another sucker just like you, and he does the same with him. That is the way of business. That's how rich men get rich, stay rich, and keep getting richer. They work on the young carpenter, the young mason, the young plumber, the new man, the new "sucker." Turn right around and do the opposite. Sell only the very best goods to be had in the market, charge a reasonable, fair business margin for your work and material; do only first-class work. Let principle before profit be your motto in life and business.

I have lived in cities and towns, and the sum and substance of my conclusions and my experience is that true happiness comes from the regard a man has for five great principles: Industry, morality, temperance, economy, justice. Follow these and you will surely win, if not all the business on the street, something far better, a happy old age, wealth, a home of your own, a clear conscience and the blessed consciousness that you have not shrunk from any personal responsibility, but have done your duty to your country and your fellowmen. Men do what they can, not what they like.

Be provident, waste not your gold
That fortune showers down;
Time tarries not, you may grow old,
And fortune may yet frown.

For that she is a fickle jade
To all, tis very plain;
Sometimes when she has your store made
She takes it back again.

Be generous, but still take heed
That those at home shall suffer none,
That you come not to bitter need,
When you with work are done.

Be generous, but not unjust,
See well what you're about;
'Tis admonition every time,
For number one, look out.

Barton A. Whitsett,
State Vice-President, M. A. M. P.

Florence, Ala., Oct. 20, 1890.

THE DANGERS OF ELECTRICITY.

At the recent meeting of the National Electric Association, Cape May, President Dr. Henry Morton, president of the Stevens Institute, gave an interesting paper on the dangers of electricity. Among other things he says:

The Employers' Liability Assurance Corporation, after collecting a mass of material from a great variety of sources, has formulated a series of rules for the protection of those employed in erecting and operating electric apparatus, involving the use of powerful and therefore dangerous currents. These rules have been examined and approved by several of the managers of prominent electric companies, and so far it would appear as if no accidents have resulted from the use of electric currents where these rules have been followed, and that most, if not all, the accidents which have occurred would have been prevented had these rules been followed and obeyed. As the author had something to do with the framing of these rules, his chief object in presenting the paper was to secure their criticism by those best able to perceive their imperfections, and such suggestions as may lead to their beneficial modification or extension. The rules are as follows:

1. Do not touch or handle any electric wire or apparatus of any sort while standing on the ground, or while in contact with any iron work, gas or water pipe or stone or brick work, unless your hands are covered with rubber gloves, and you are provided with such properly insulated tools as have been declared to be safe and in good order by the electrician or other competent officer of this company.

If it is at any time necessary to stand on the ground, or on any surface not insulated from the ground, while handling electric wires or apparatus, rubber boots or an insulated stool should be used.

In moving wires hanging on or lying over electric light wires, lamps or fixtures, use a dry hand line.

2. Never handle any electric wire or apparatus with both hands at once when this can be avoided, and if it is necessary to do so, be sure that no current is present, or that one or both hands is protected by rubber gloves or other efficient insulation.

3. When handling line wires, treat each and every wire as if it carried a dangerous current, and under no circumstances allow yourself to make contact between two or more wires at the same time.

4. Never open a circuit which has been in use without giving notice to the superintendent, or whoever is in charge, of your intention to do so, and at the same time request that the same line be opened at the main station, and kept open until you have given notice that your work on that line is complete.

5. In the dynamo room never go near the belts or dynamos, nor touch any apparatus unless you are fully informed or instructed how to do so.

Tools used by linemen should be provided with insulating handles of hard rubber or other equally good insulator. It is the duty of each lineman to look after his own tools and see that they are in good order, especially as to their insulation.

6. Lamp trimmers and others engaged in the care of lamps must see that the switch putting the lamp in circuit is turned off before they handle the lamp in any way.

7. In construction work, a space of at least 20 inches must be left between the holes for the pins on the cross arms, so that a lineman may get to the top of the pole and work without danger.

The same insurance association has collected the authentic records of a number of so-called "electric accidents" or accidents happening to the electric companies. I have now before me the abstracts of 91 such cases.

Dr. Morton concludes as follows: "Of course I do not mean to imply by this that these rules are perfect or complete, but only that they seem to be in the right direction, and to furnish a starting point from which further developments may proceed.

"No one having even an elementary knowledge of electricity as it existed ten years ago need or needs to be convinced of its power to do harm where all safe guards are removed, and the occasional declarations of its harmless character which have been uttered can only be accounted for by reference to that combative disposition which impels some minds always to take a view in opposition to any which may be expressed, and gives birth now and then to a book or pamphlet disproving the law of gravitation or the solar origin of light and heat. To say this is, however, far from agreeing with the other extremists who would banish electricity from our daily walks and occupations, or place it under restrictions which might render it harmless, but which certainly would render it relatively useless for the countless purposes in which its efficiency demands its full development.

"The true opinion is that which is supported by past experience, and which advocates the fullest development of power to which this agency can attain, combined with the use of all the means of protection by which human intelligence can protect itself while using to the utmost this potent and, therefore, dangerous weapon in our victorious contest with the inimicably destructive forces of nature."

WHEN TO DO AND WHEN NOT TO DO.

D. T. Mallett, of New Haven, Conn., is the author of the following maxims, which we borrow from *The Office*:

When you wish to do business, go where business is done.

When you furnish the capital and another the experience, don't swap.

When you receive tuition from experience, don't forget to graduate.

When you attempt to run to success, be careful not to stub your toe.

When a desirable article is purchased low, its sale is already secured.

When undesirable goods accumulate, the wheels of business are clogged.

When you would be truly economical, avoid not expenditure, but waste.

When there is an absolute loss in business, it is generally the result of ignorance.

When you have learnt to serve faithfully, you may be expected to command wisely.

When you would better your memory, exercise it. Rust, not use, is the prime element of decay.

When you seek for the merchants of the future, look for them among the clerks of to-day.

When you despond for lack of public encouragement, keep the fact to yourself, don't advertise it.

When you start in business, expect to succeed; the range of a cannon depends upon its elevation.

When your acquaintance with the details of your business broadens, your success is more assured.

When you would determine the value of a man's character, observe how he spends his leisure moments.

When you cultivate the faculty of associating names with faces, it will prove a decided benefit to your trade.

When your stock is turned over often, you can afford to sell cheaper and still increase the net profit.

When you word an advertisement, claim nothing which is not strictly true, but never fail to claim all the truth.

When you come to regard employees as mere machines, you should, if consistent, regard yourself as the crank.

When you lock your store door at night, leave your business inside. No balmy sleep with worry for a bedfellow.

When a business is said to run itself, it is generally the result of the force of gravitation. Gravitation is always downward.

When you accumulate wealth, consider it as a trust. Use it for the benefit of others. Generosity is its own steward.

When you find a successful salesman, you will notice that his business knowledge is superior to that of his customers.

When the credit you extend and the goods you possess are in excess of both your own credit and cash, look out for the sheriff.

When you have an employe whom you consider indispensable, it is time either to give him an interest or accept his resignation.

When you find yourself inclined to be rash in buying stock, remember that "it is better to cry after the goods than over them."

When you are eagerly seeking the secrets of success, remember that the study of human nature is as important as the perusal of manuals.

When you feel envious of the apparently rapid success of a competitor, remember that often the prize of wealth is dearly purchased.

When you have a decided taste for it, possess sufficient capital, and are acquainted with the details, you are fitted to engage in any business.

When an employe is given an interest, even if it be a small one, his efforts become concentrated, because your interests are allied to his own.

When you seek to obtain credit in excess of the amount of your capital, you have crossed the prudent line which divides business from speculation.

When you select a business friend, study his failings, to avoid them. We naturally imitate evil, but the good is only attained by persistent effort.

When you possess a quick perception, ballast it with perseverance. To conceive may be the action of a moment, but to execute, the labor of years.

When a man of energy approaches a wall of obstacles, he does not scramble over or creep under, but his concentrated action of purpose forces an opening.

When you would gain customers, advertise; when you would keep customers, advertise. Advertising pays if done liberally, honestly and judiciously.

When you inquire into the causes of a marked success, you will invariably discover that much of it was due to ability to select and retain efficient employes.

When you hang a sign outside your place of business, it pays to have a good one. It is a permanent advertisement, and indicative of your business method to the public eye.

When you are obliged to make heavy purchases on credit, have it understood that in case you are unable to settle when due, your note will be accepted without indorsement.

When you have secured a fine location, an excellent stock and admirable fixtures, remember that the real end of business is to sell goods, not the keeping of a museum.

When a friend asks you to indorse for an amount which you could not afford to lose, let your answer depend upon your valuation of his friendship as compared with your own honor.

When you have exerted your full abilities, and success seems doubtful, train your mind to review results calmly. Be sanguine. Worry, not work, is the bane of many lives.

When you have decided upon a course in business, which is satisfactory to your own mind and experience, do not allow the doubts of others to dampen your enthusiasm.

When seeking the elements of success, do not ignore bodily health. The body is the servant of the brain, and both master and menial are better for healthful recreation.

When you word an advertisement, remember that the public

judges your business capacity, in a measure, by the method you use. Therefore, avoid copying other people's ideas.

When you expect an advertisement to create business, word it for business. An advertisement has no life in itself; it depends for its efficiency upon the vigor with which you endow it.

When you possess the ability to calculate the future from the circumstances of the present, you have one of the greatest qualifications for success. Foresight is more profitable than hindsight.

When you advertise, your main object should be to associate your name with your goods; next, to make a distinct statement, and last, though not least, to adopt a novel and effectual medium.

When you hesitate about engaging in an advertising scheme from fear of "being talked about," remember that business is not a social affatr. However, do not lean too far toward the eccentric.

When you are accumulating money in your own business, it is better to use it in extending the business, rather than to invest the surplus in some other line of trade beyond your immediate control.

When you begin to have some doubt of the superiority of your own abilities, you are on the threshold of a fresh advance. Over-self-confidence is a rock which has sunk many a young mercantile mariner.

AMONG THE PLUMBERS.

If outward appearances are any indication of prosperity, J. A Denniston of 148 North Clark street is getting his share of the business in Chicago. A new horse and wagon now hauls plumbing material for him to all parts of the city. He has just finished some nice jobs on the South Side, and is at present engaged fitting up a flat buildlng on the West Side. Mr. Denniston has a large class of customers on the North Side where he resides, and with his increased facilities for doing first class practical work, will be able to accommodate his many patrons all over the city.

James J. Renn and Thomas H. Renn, who formed a partnership in the plumbing business some three months ago, are nicely situated at 142 North Clark street. They report several new building contracts on hand and a good class of jobbing work.

The new master plumbers association just recently organized by National President Robert Griffith, at Cedar Rapids, Iowa, has elected the following officers: President, Jacob C. Messner; Vice-President, F. Seely; Secretary, E. O. Edson. Mr. Griffith reports the new organization in a flourishing condition and very bright prospects for a firm protection of the plumbing interests in the future. Mr. Griffith also organized an association in Lincoln, Nebraska, during his flying trip in the Southwest and West.

Mr. Fleming, an old plumber of Chicago, who so kindly looked after the comforts of the Chicago delegation on the trip to Denver last June, has again changed his profession and no longer represents the Chicago, Rock Island & Pacific Road. This time Mr. Fleming has joined the army of real estate men in Chicago, and will henceforth sing the praises of lots and acres in the World's Fair city.

A. C. Hickey, of West Madison street, has a number of good contracts on hand at present. He will fit up the following new buildings: A four-story double flat building on South Morgan and Monroe streets for H. W. Martin; a new factory at Ogden Place for the Electrical Supply Company; a three-story residence at Austin for John Kerr; a three-story residence on Adams and Western avenue for James McGraw and a six-story double flat building on Peck Court for H. E. Bucklen. He is putting in water connections for Chrisholm Boyd & Co., on Fifty-seventh and Sherman streets. He is also taking out and replacing the plumbing and gas fitting at 234-238 Market street for Joseph Downey & Co. He has just completed putting in complete stage connections and fittings in the house of L. Wolff on Washington boulevard. The new plumbing work in the Warren Springer business block on South Canal street will also be done by Mr. Hickey.

Andrew Young will address the Chicago Master Plumbers at their meeting next week. He will talk on plumbers and the Health Department.

The plumbing establishment of Aitken Plumbing Company, in New Orleans, La., was recently burned. The loss, amounting to about $40,000, was partly covered by insurance.

The Calumet Hardware and Plumbing Company, of Calumet, Michigan, is under the management of John H. Parker.

The plumbing class in the New York Trade Schools numbers about 120 members. There is a strong demand for the organization of an extra class.

The firm of H. L. Hunt & Co., of Pittsburg, have secured several handsome jobs of plumbing. They will place the plumbing in a building on Highland avenue, in a house on the corner of Ward and Frazier streets, and in a building on Shetland avenue. B. F. Call & Co., of the same city, will fit up three houses on Clark street, and two on Centre avenue.

Thomas C. Crandall, a new plumber of Danville, Illinois, is doing a good business in his new quarters.

The Fort Smith Cornice and Plumbing Works is a new firm at Fort Smith, Arkansas.

Robert Griffith, President of the National Association of Master Plumbers, accomplished a great deal on his recent trip through the West. He visited five states and some dozen cities on this trip. The plan he followed was to travel nights and work days. Besides putting the boys on the right track in Texas, he organized several local associations in some of the Western cities. He speaks very encouragingly of the condition of trade in Texas, Missouri, Kansas, Nebraska and Iowa.

We are very sorry to learn of the sickness of John Byrns, ex-President of the National Association of Master Plumbers.

John Kerr, inspector of the sewers of New York City, died on the 14th of October. He was buried with military honors by the Shiels' G. A. R. Post, of which he was a member.

The plumbers of Rock Island and Moline, Illinois, will be entertained by the Davenport plumbers at Davenport this evening. Good music and dancing will be the order of the evening.

Mr. Hugh Watt, President of the Chicago Master Plumbers' Association, is improving slowly. He has been sick over two months.

THE TEXAS MASTER PLUMBERS.

President Robert Griffith was found at the headquarters of the National Association of Master Plumbers, on his return from the Lone Star State, and kindly gave us an account of his trip and the meeting of the Texas plumbers at Dallas.

He speaks in very high praise of the Texas people, and says the master plumbers in that locality are now well organized. The State Association was called to order in the auditorium of the City Hall, at 10:15 on the morning of Oct. 23d. The President, Mr. Madden, introduced Mayor Connor, of Dallas, who welcomed the guests very cordially to the hospitalities of the city.

Mr. Griffith was next introduced, and spoke on the relation of the State Association to the National Association of Master Plumbers. All necessary arrangements were made at the afternoon session for joining the National Association, and the new state organization was welcomed into the National fold by President Griffith. After a picture of the entire delegation was taken, the visitors were invited to a carriage-ride over the city. Several communications were read at the evening session, and the place of holding the next meeting was determined. The association adjourned to meet at San Antonio on the second Wednesday in May, 1891.

After adjournment, the members of the association and visitors assembled in Hebrew Hall, where a table groaned with all varieties of luxuries. The appetites of the members of the craft were first satiated, after which came a season of speech-making. A representative of every town in the state vied with each other in pleasing the jolly audience of listeners.

On Friday the delegates attended the fair, which was in progress at Dallas the week of the convention.

The officers for the ensuing year are J. F. Madden, of Sherman, president, and J. L. Brazelton, of Waco, secretary.

Among the towns that were represented, and the names of the representatives, were: Austin, W. A. Bourke; Corsicana, S. C. Carroll, T. S. Brooks; Denison, T. P. Pettit, C. Waltz, E. H. Cambell; El Paso, A. Bertie, W. Davis; Ft. Worth, G. W. Kite, J. A. Rogers, G. D. Ackley, J. F. Osborne, J. B. Austin; Galveston, F. J. Kirk, F. J. Mace, Paul Sheehan, D. J. May, D. Wainwright; Houston, W. W. Otherside, D. McMahon; Paris, F. R. Perkins; San Antonio,

Atkins & Co., C. Shafer, Ed. Braden, Morgan & Co., D. Kirkenard, G. Pruitt; Waco, J. Brazelton, C. N. Curtis, W. N. Orand; Sherman, Jas. Madden; Dallas, Kavanagh & Son, Reid & Munninert, A. McWhirk, East Dallas Plumbing Co., D. F. Sullivan, Pellentz & Co.; Ft. Worth, T. A. Campbell, Renecke Bros., James Burke, Walter Dowarare, L. Higby.

Among the supply-houses represented were: N. O. Nelson, by J. C. Warren; Cahill, Collins & Co., by F. J. Murphy; Western Brass Manufacturning Co., by H. L. Rhines; Ramsey & Sikemeier, by Frank Callbeck; L. Wolff Manufacturing Co., by Geo. Wybrant; Blackimer & Post, by J P. Wallace.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Tacoma, Wash.: A new city hall will be erected on the corner of Ninth and C streets; cost, $300,000. Hatherton & McIntosh, architects.——Tallapoosa, Ga.: A hotel, to cost $100,000. S. M. Patton, Chattanooga, Tenn., architect.——Terrell County, Ga.: A new court house will be erected; cost, $30,000.——Thurlow, Pa.: The A. M. E. Zion church will erect a new edifice.——Washington, Pa.: A new Baptist church will be erected.——Waterbury, Conn.: A new school building will be erected.——Wheeling, W. Va.: A new bank building. J. B. Hall, architect.——Winter Park, Fla.: $25,000 will be expended on the Winter Park hotel.——Arlington, Va.: The Arlington Development Company will soon erect twenty tenement buildings.——Amirston, Ala.: A brass and plumber's supply foundry will be erected. Address R. H. Cobb, for particulars.——Arkansas City, Ark.: The Kentucky and Arkansas Land and Improvement Company will erect a hotel building to cost $20,000.——Austin, Tex.: A cotton mill will be erected; cost, $500,000.——Birmingham, Ala.: A stock company has been organized to erect a cotton factory. A school building will be erected; cost, $40,000. Address Messrs. Thompson & Hutchinson.——Boerne, Tex.: A stock company is about to erect a hotel building.——Charlotte Harbor, Fla.: A new Methodist church will be erected.——Chicago, Ill.: 299-303 Clark street, an eight story addition. W. L. B. Jenney, architect, 283 Oakwood boulevard, a six-story apartment building; cost, $70,000. Patton & Fisher, architects. Twenty-second and Dearborn streets, a four-story store and flat building; cost, $15,000. Julius H. Huber, architect. Monroe street, near Kedzie avenue, a two-story residence. Julius H. Huber, architect. Louis Martens has plans for a four-story store and apartment building to be erected on the corner of Twelfth street and California avenue at a cost of $15,000. He is planning three two-story dwellings to be erected on Langley avenue, near Forty-eighth street; cost, $15,000. He has also planned a three-story flat building to be erected at 648 Polk street; cost, $14,000. Titus Diethelm has prepared plans for a three-story store and flat building to be erected on 92nd street in South Chicago; cost, $10,000. Beman & Parmentier are engaged on plans for three two-story residences to be erected in Hyde Park; cost, $15,000. Corner Spaulding and Ogden avenue a three-story store and flat building; cost, $20,000. N. S. Devine, architect. Thirty-fifth street near Rhodes avenue, a three-story store and flat building; cost, $25,000. N. S. Devine, architect. Forty-seventh street and Center avenue, a four-story store and flat building; cost, $16,000. Henry Sierks, architect. Greenwood avenne, near Forty-fourth street, a two-story residence; cost, $15,000. Henry Sierks, architect. The Ostling Brothers are preparing plans for a six-story apartment building to be erected on the corner of Thirty-sixth street and Indiana avenue; cost, $100,000. They have prepared plans for an eight-story office building to be erected on Quincy street, near La Salle street; cost, $100,000.——Detroit, Mich.: Corner Second avenue and M. C. R. R., two and one-half-story brick manufactory; cost, $30,000. Gordon W. Loyd, architect.——Findlay, O.: $50,000 church building will be erected.——St. Louis, Mo.: The Mercantile Club will erect a $250,000 club house. Judge John H. Terry, J. B. Case and others, are interested in the enterprise. Leffingwell and Lucas avenues, a brick store and dwelling; cost, $25,000.——Red Bank, N. J.: A new Baptist church is to be erected. For particulars address the Rev. J. K. Manning, pastor.——Rockwood, Tenn.: The Rockwood Hotel Company will erect a hotel, to cost $30,000. from plans prepared by W. H. Floyd, of Chattanooga, Tenn.——Sharon Hill, Pa.: A new Methodist church is to be erected.——South Amboy, N. J.: A new Baptist church is to be erected.——Springfield, O.: Corner Limestone and Main streets, stone front building; cost, $50,000.——Steelton, Pa.: The Pennsylvania Steel company contemplates erecting a foundry, and the company's draughtsman is now preparing the plans.——St. Paul, Minn.: Richmond, near Clay street, kitchen laundry, bedrooms and boiler house; cost, $40,000.——Middletown, Conn.: The city officials have instructed J. M. Hubbard to secure plans for a town and county building.——Milwaukee, Wis.: Broadway and Mason street, office building; cost, $40,000. Ferry & Clas, architects.——Minneapolis, Minn.: 325 First avenue, a brick office building; cost, $27,500. J. Haley, architect.——Providence, R. I.: Beacon avenue and Frank street, a school building; cost, $25,000.——Brooklyn, N. Y.: Central avenue and Woodbine street, eight three-story stores and tenements; cost, $42,000. Architect, E. B. Sturgis. Waverly avenue, near Green avenue, two three-story and basement brick dwellings; cost, $20,000. Architects, Danmar & Fischer. Corner Willoughby and Grand avenues, three-story brick clock factory; cost, $96,000. Architect, Benj. Wright. Seventh avenue, near Carroll street, four four-story brick stores and flats; cost, 36,000.——Boston, Mass.: Highland avenue, three brick dwellings; cost, $20,000.——Braintree, Mass.: Holbrook avenue, stone depot; cost, $32,000.——Denver, Col.: Logan, between Thirteenth and Fourteenth avenue, dwelling; cost, $31,000. Architect Kidder & Humphries. Broadway, between Cedar and Beyers street, brick store; cost, $20,000. A. M. Stuckert, architect.——Potsdam, N. Y.: Ives Bros. are about to build three additional stores to the ones now building; cost, $15,000 to $18,000. J. P. Johnson, Ogdensburg, N. Y., architect.——Mount Holly, N. J.: The Mount Holly carpet mills have been purchased by James Dunlap & Co., of Philadelphia, and additional buildings will be erected at once.——New Decatur, Ala.: A furniture factory will be erected by a recently organized stock company.——Orlando, Fla.: Mayor Marks is to establish a cigar factory.——Kimball, Tenn.: S. M. Patton, Chattanooga, Tenn., has plans completed for a hotel to cost $125,000. Separate contracts will be let for heating, plumbing, elevators, etc.——Marion, Pa.: An opera house is to be erected, at a cost of $25,000.——Danville, Ky.: Crapsey & Brown, architects of Cincinnati, O., are preparing plans for a $15,000 school building.——Fernandino, Fla.: A cold storage warehouse and ice factory is to be erected by a stock company.——Findlay, O.: Presbyterian congregation will build a $40,000 church in the spring. No plans have been accepted. R. M. Mitchell, pastor.——Fisher's Island, Conn.: Plans are being prepared for a large hotel, to be erected by G. Hoppes.——Glassboro, N. J.; Whitney Brothers are about to erect 20 dwellings.——Hartford, Conn.: The plans and specifications for the new building of the Board of Trade Room and Power Company of Hartford are now ready and may be seen at the office of the Hartford Screw Company. The plans were constructed under the supervision of George E. Witherell, mechanical engineer of the Hartford Machine Screw Co., and the whole has been under the general supervision of Mr. George A. Fairfield, who can furnish particulars.——Hot Springs, Ark.: An extensive addition is to be made to Hotel Eastman, by Messrs. Sithen & Daw.——New York City: Seventy-second street, near Boulevard, four four-story and basement brick dwellings; cost, $60,000. Architect, W. H. Boylan. One Hundred and Thirteenth street, near Fifth Avenue, four five story brick flats; cost, $88,000. Architect, John C. Burne. One Hundred and Thirteenth street, near Seventh Avenue, two five-story brick flats; cost, $44,000. Architect, John C. Burne. One Hundred and Fifteenth street, near Madison Avenue, three five-story brick and stone stores and flats; cost, $85,000. Architect, Andrew Spence. Corner of Eighty-third street and First avenue, four five-story flats; cost, $72,000. Thom & Wilson, architects. Ninety-first street, near Avenue A, ten-story factory; cost, $350,000. Architect, Alfred Tucker. 119-121 Forty-first street, five-story flat; cost, $25,000. Architects, D. & J. Jardine. 1105 Third avenue, five-story brick store and flat; cost, $25,000. Architects, Schneider & Herter. 230-236 Twenty-first street, four five-story brick flats; cost, $92,000. Architects, Schneider & Her-

ter. Eighth avenue, near One Hundred and Eighteenth street, two five-story brick stores and flats and six five-story brick stores and tenements; cost, $78,000. Architect, Wm. Graul. Eighty-third street, near Columbus avenue, five-story brick flat; cost, $25,000. Architect, James W. Cole. One Hundred and Sixteenth street, near Madison avenue, two five-story brick flats; cost, $50,000. Architect, James W. Cole.——Coatesville, Pa.: At a recent congregational meeting, plans for a new Presbyterian Church were adopted. Steam heat will be introduced and all modern improvements. The pastor of the church is Rev. Henry A. MacKubbin.——Cleveland, O.: Mr. Schweinfurth has plans on the boards for a cathedral, parish house and church house.——Wabash, Ind.: The Indiana Steel Company will erect a streel plant.——Clinton, Ia.: The City Engineer is preparing plans for a $100,000 plant for the manufacture of street paving and building brick.——Lowell Mass.: The Shaw Stocking Company will double the capacity of their works.——Madison, Ill.: Railroad carworks, to cost about half a million dollars, will be erected. The Merchants' Terminal Bridge Railway Company, of St. Louis, Mo., are interested in the enterprise.——Pell City, Ala.: A company, with a paid up capital of $200,000, has been formed for the purpose of erecting a plant at this place for the manufacture of all kinds of ron pipe and plumbing fixtures. Operations are expected to begin within ninety days.——St. Louis, Mo.: President Taussig, of the St. Louis Terminal Board, can give information of the proposed construction of a new union depot in this city.——Little Rock, Ark.: The Iron Mountain Railroad will build a $50,000 roundhouse.

HEATING AND LIGHTING.

Rushville, Ill.: The electric lighting plant projected for this place will be constructed at once.——Pittsfield, Mass.: The sum of $25,000 is to be expended on an electric light plant.——Cambridge, O.: Bids for lighting the city will be asked for at once.——Sturgis, S. D.: An electric light plant is to be established.——Bradford, Ont.: An electric light plant is to be established, at a cost of $15,000. Stony Creek and Short Beach, suburbs of this city, are also to be lighted.——Leighton, Pa.: The Carbon County Manufacturing Company has been organized, with a capital stock of $50,000, to start an ice factory and electric light plant.——Titusville, Fla.: The electric light plant projected for this place is to be established at once. For particulars address S. F. Gray.——San Francisco, Cal.: The Mutual Gas and Electric Light Company has been incorporated, with $3,000,000 capital. Directors—Israel W. Knox, Edward Bosqui and others.——Shamokin, Pa.: It has been decided to establish an electric light plant.——Hannibal, Mo.: The city council, at a special meeting held October 20, decided to submit to a vote of the people a proposal to issue bonds amounting to $20,000 to increase the power of the electric light plant from 100 to 300 horse-power, to the end that an incandescent light plant may be put in and operated in connection with the present arc-light plant, owned by the city.——Little Falls, N. Y.: It is proposed to establish a system of electric lighting. Address for particulars Alderman John H. Kane.——Waterford, N. Y.: The question of introducing an electric light plant is being discussed by the local officials.

SEWERAGE NOTES.

Atlanta, Ga.: Extensive sewer work is to be done. Address the City Engineer for particulars.——Akron, O.: The construction of a storm water-sewer is projected.——Belfast, Me.: The question of introducing a system of sewerage is being discussed by the local officials.——Babylon, N. Y.: There is a project on foot to establish a system of sewers. The Town Clerk can furnish particulars.——Oakland, Cal.: Considerable new sewer work has been authorized.——Trenton, N. J.: Numerous sewer extensions are to be made. Address the Clerk of the Board of Water Commissioners.——Haverhill, Mass.: The Board of Aldermen has authorized the construction of numerous additional sewers.——Salem, N. J.: The local officials are considering the question of putting in a sewer on West Broadway. T. J. Yorke has been authorized to consult Col. Waring on the subject.——Hamilton, Ont.: Numerous sewer extensions are to be made.——Providence, R. I.: Sewer construction is progressing slowly on account of the scarcity of good laborers.——Buffalo, N. Y.: The plans for the east side sewerage system, prepared by Emil Kuichling, have been approved by the Sewer Committee, which recommends that a consulting engineer be called in to report on them. Ordinances have been introduced for two stone sewers, costing $79,000.——Rochester, N.Y.: A number of extensive pipe and stone sewers, costing about $80,000, are under discussion in the common council.——Suspension Bridge, N. Y.: A new sewerage system has been adopted by a vote of 118 to 82.——Pittsburg, Pa.: A new sewer, about three miles long and nine feet in diameter at the largest point, will be constructed for next year. Address W. R. Browne.——Max Meadows, Va.: A sewerage system and water-works are proposed by the Land and Improvement Co.——St. Louis, Mo.: Sewer Commissioner McMath is preparing plans for separate sewers over a large section of the city.——San Francisco, Cal.: The sewerage system for the Port Lobos district, proposed by City Surveyor Smith and approved by Rudolph Hering, has been adopted by the supervisors.——Duluth, Minn.: A large number of storm-sewers will be constructed.

WATER-WORKS NOTES.

Cisco, Tex.: A charter has been obtained to supply the town with water; supply to be got by damming a canon; 145 acres of ground bought. Engineers are making proper estimates, etc., for dam, stand-pipe, engine, pipes, etc.——San Angelo, Tex.: It has been decided to lay seven additional miles of water-mains. Address J. I. Millspaugh for particulars.——Manchester, N. H.: The report of the engineer, M. M. Tidd, of Boston, has been accepted by the Water Board, who voted to have it printed and to submit the matter to the city government for further action.——Alliance, Neb.: A system of water-works, to cost $20,000, is to be established, Plans, etc., are now being prepared by A. A. Richardson, of Lincoln, Neb., who will furnish particulars.——Canton, S. D.: Engineer A. A. Richardson, of Lincoln, Neb., is now engaged getting up plans for $21,000 water-works for this city. For further information apply to him.——Quincy, Ill.: Plans and estimates are now being made for a complete system of water-works.——Sturges, S. D.: This place is to have a complete system of water-works at once.——Martinsville, Va.: The projected water-works will be established at once.——Seymour, Tex.: It is proposed to establish a complete system of water-works. Address Morgan Jones for particulars.——Union City, Wash.: The water-works system is to be increased by the addition of numerous branch lines.——Key West, Fla.: Numerous additional water-mains are to be laid. Address Pres't Maloney, of City Commissioners, for particulars.——Dayton, O.: Important water-main extensions are to be made.——Belleville, Ill.: The city council has authorized Mayor Rainey to appoint a committee of three of its members to confer with the Board of Trade, manufacturers, millers and business men generally in reference to the proper steps to be taken to secure an ample supply of good, pure water.——Zanesville, O.: J. W. Hill, C. E., of Cincinnati, O., has recommended that the sum of $175,000 be expended for the improvement of the water-works system.——San Francisco, Cal.: The American Land and Water Company has been incorporated by Timothy F. McCarthy, Edwin Windele, and others. The capital stock is $200,000.——Elgin, Ore.: The Elgin Water-Works Company has been incorporated, and a plant will be established. For particulars address J. W. Snyder.——Davenport, Iowa: The Davenport Water Company has decided to establish a filter system in connection with its plant.——North Brookfield, Mass.: By a vote of 248 to 78 the town has voted to establish works. An appropriation of $1,000 for preliminary surveys has been made and Theodore C. Bates, Francis Batcheller and Alden Batcheller have been appointed as water commissioners.——Yorkshire Centre, N. Y.: Water-works are projected.——Grove City, Pa.: Works will be constructed. Address William Young or Captain Craig.——Braddock, Pa.: A reservoir of 4,000,000 gallons capacity will be erected.——Beaver, Pa.: Large extensions will be made to the present works. Address the Union Water Co.——Buchanan, Va.: The Central Land Co., which is developing a town here, has projected works to take their supply from springs about 5½ miles distant. The scheme includes a 4,000,000 gallon reservoir about 135 feet above the hotel site and 240 feet above the river.——Kettle Falls, Wash.: About $15,000 will be expended for water-works. The supply will be from a spring.——Sellwood, Ore.: A water company, with a capital stock of

$35,000, will soon be incorporated by Richard Leaman, William I. Ball and George P. Dorris. The supply will be from wells, and water for fire protection will be furnished without charge. ——Somerville, Tenn.: Bids for sinking an artesian well are wanted by Thomas B. Yancey, Mayor.——Dallas, Tex.: Address Webster and Wood regarding an artesian well to be sunk on Caruth Heights.——Tyler, Tex.: Wells will be sunk in the Rowland addition by E. N. Orkney.

BIDS AND CONTRACTS.

Fort Thomas, Ky.: Sealed proposals, in triplicate, subject to usual conditions, will be received at office of Constructing Quartermaster, U. S. A., Fort Thomas, Ky., until 11 A. M., November 27, 1890, and then opened, for construction there of a hospital and hospital steward's quarters, and for the steam-heating apparatus for the hospital, and for the plumbing of each building. Plans and specifications to be seen at this office, with full instructions as to bidding. Envelopes containing proposals should be marked "Proposals for Hospitals, etc.," and addressed to First Lieutenant R. B. Turner, 6th Infantry, A. A. Q. M., U. S. A ——Brownsville, Tex.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 25th day of November, 1890, for all the labor and materials required for the erection and completion of the U. S. court-house, custom-house and post-office building at Brownsville, Tex., in accordance with the drawings and specifications, copies of which may be had on application at this office or at the office of the superintendent at Brownsville, Tex. Proposals must be inclosed in an envelope, sealed and marked "Proposal for the Erection and Completion of the U. S. Court House, Custom-House and Post-Office building at Brownsville, Tex.," and addressed to Jas. H. Windrim, Supervising Architect ——Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 20th day of November, 1890, for all the labor and materials necessary to complete the approaches, mailing-platform, post-office, lookout, etc., for the U. S. court-house and post-office building at Pittsburg, Pa., in accordance with the drawing and specification, copies of which may be had on application at this office or the office of the superintendent. Proposals must be inclosed in an envelope, sealed and marked "Proposals for the Approaches, Mailing-Platform, Post-Office, Lookout, etc., for the U. S. Court-House and Post-Office building at Pittsburg, Pa.," and addressed to Jas. H. Windrim, Supervising Architect.——Charleston, S. C.: Proposals are wanted until December 1st for sinking an artesian well. Address Zimmerman Davis, Secretary Water-Works Department.——Victoria, B. C.: Proposals are wanted until December 17th for the construction of certain sewers. Address Wellington J. Dowler.——Ellsworth, Kan.: Proposals are wanted until November 15 for constructing a system of water-works on the reunion grounds. Address Ira F. Collins, Department Commander and Chairman Trustees G. A. R.——Harrison, O.: Proposals are wanted until November 24 for the construction of a system of water-works. Address Mayor J. A. Graft.——Jersey City, N. J.: Proposals are wanted until December 1 for lighting the public streets for one year from December 1. Address G. F. Robinson, Clerk of the Board of Police Commissioners.——Chambersburg, Pennsylvania: Sealed proposals will be received at the office of the clerk to town council, until noon on Thursday, November 20th, for the construction of a two-million-gallon reservoir, and furnish, lay and connect about 9,000 feet of ten and twelve inch cast-iron pipe, with the special castings, etc. Separate proposals received for the construction of reservoir and pipe and laying, or both together. Plans and specifications can be seen at the council-chamber, Chambersburg, Pa., and at the office of John Birkinbine, No. 25 North Juniper street, Philadelphia, Pa. D. B. Kirby, Clerk.——Galt, Can.: Sealed tenders will be received by I. G. Dykes, Esq., town clerk of Galt, Ont., Canada, until 12 o'clock, noon, on Monday, the 17th day of November, A. D., 1890, to be endorsed "Tenders for Water-Works." Plans, specifications, forms of contract, etc., may be seen on and after Oct. 13, 1890, at the office of the town clerk and at the office of the city engineer, 103 Bay street, Toronto. I. G. Dykes, Town Clerk; Willis Chipman, Chief Engineer.——Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 18th day of November, 1890, for all the labor and materials required for the joinery work, wood flooring, etc., of the U. S. court-house and post-office building at Pittsburg, Pa., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent. Each proposal must be inclosed in an envelope, sealed and marked "Proposal for the Joinery Work, Wood Flooring, etc., for the U. S. Court-House and Post-Office building at Pittsburg, Pa.," and addressed to Jas. H. Windrim, Supervising Architect.——Arvon, Mich,: Proposals will be received at this office for the furnishing of the labor and material for the construction of an Ore Dock for the Iron Range & Huron Bay R. R. Co. on Huron Bay, Lake Superior, Baraga county, Mich., until 12 o'clock noon, Nov. 15, 1890. Plans and specifictions can be seen at this office. Miles Davis, chief engineer.——Winona, Minn.: Sealed proposals will be received at the office of the Superviisng Architect, Treasry Dept., Washington, D. C., until 2 o'clock P. M. on the 19th day of November, 1890, for all the labor and materials required to furnish and fix in place complete the low-pressure, return-circulation, steam-heating and ventilating apparatus, and to complete the plumbing of the United States court-house, post-office, etc., building at Winona, Minnesota, in strict accordance with drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Winona, Minn. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Low-Pressure, Steam-Heating and Ventilating Apparatus, and for completion of the Plumbing of the U. S. Court-house, Post-Office, etc., building at Winona, Minn.," and addressed to Jas. H. Windrim, Supervising Architect.

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At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. MARTIN, General Passenger Agent, Cincinnati, Ohio.

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Denniston, J. A., 148 N. Clark street.
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Hickey, A. C., 75 S. Clinton street.
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Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Probasco, R. P., 36 and 38 Dearborn street.
Reilly, Joseph & Bro., 517 W. Madison street.
Roche, J. H., 208 Thirty first street.
Roughan, M. J., 25 Quincy street.
Ruh, Valentine, 548 Wells street.
Sanders, P. & Son, 505 State street.
Schmidt, Ira T., 145 Michigan street.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
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HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED.—FIRST-CLASS PLUMBERS. None but competent men need apply. No fares paid. W. H. S., 1212 Douglas St., Omaha, Neb.

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SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A THOROUGHLY competent heating engineer. Can do anything from soliciting to practically doing work. Location no object. Address, "H. E.," THE SANITARY NEWS.

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SITUATION WANTED.—BY A HUSTLER, 22 years of age, six years' experience in the Plumbing, Gas and Steam Supply business, as city solicitor for some A1 Supply house. Would take position in house for a while to show that I am well qualified. Address,

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SEALED PROPOSALS.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 19th day of November, 1890, for all the labor and materials required to furnish and fix in place complete the low pressure, return circulation, steam heating and ventilating apparatus, and to complete the plumbing of the United States Court House, Post Office, etc., building at WINONA, MINNESOTA, in strict accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Superintendent at Winona, Minn. Each bid must be accompanied by a certified check for $300.00. The Department will reject all bids received after the time herein fixed for opening the same; also all bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in envelopes sealed and marked "Proposal for Low Pressure, Steam Heating and Ventilating Apparatus, and for completion of the Plumbing of the U. S. Court House, Post Office, etc., Building at Winona, Minn.," and addressed to JAS. H. WINDRIM,
October 25th, 1890. Supervising Architec t

BUILDING PERMITS.

Geo. O. Gorden, 4 2-sty and att brk dwllgs, 72x65, 4226-32 Langley ave; a, Geo. O. Gorden...	12,000
C. C. Landt & Co., 3-sty and bst brk dwllg, 24x61, 4313 Drexel boul; a, C. M. Palmer.....	10,000
Middendorf & Croffree, 48 2-sty and bst brk strs and flts, 42x85, 4524-26 Cottage Grove ave; a, P. W. Anderson.....	25,000
J. C. Trainor, 3-sty brk str and flts, 25x80, 115th st.....	7,000
Mrs. Sarah J. Hyde, 3-sty and bst brk flts, 21x65, 484 42d st.....	5,000
John Zemos, 3-sty and bst brk flts, 22x59, 4819 Langley ave; a, John Johnson.....	5,000
Frank Johnson, 2 4-sty and cel brk flts, 44x53, 107-9 Sedgwick st; a, Ostling Bros.....	15,000
S. H. Harris, 2-sty and cel and att bst dwllg, 22x62, 1489 W. Monroe st; a, J. H. Huber.....	7,000
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B. Callagan, 3 2-sty brk str and flts, 60x85, 134-36, 35th st; a, Flanders & Zimmerman.....	30,000
John Kudsen, 3-sty and bst brk str and flts, 28x81, 739 N. Western ave; a, Lutkin & Co....	7,000
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A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

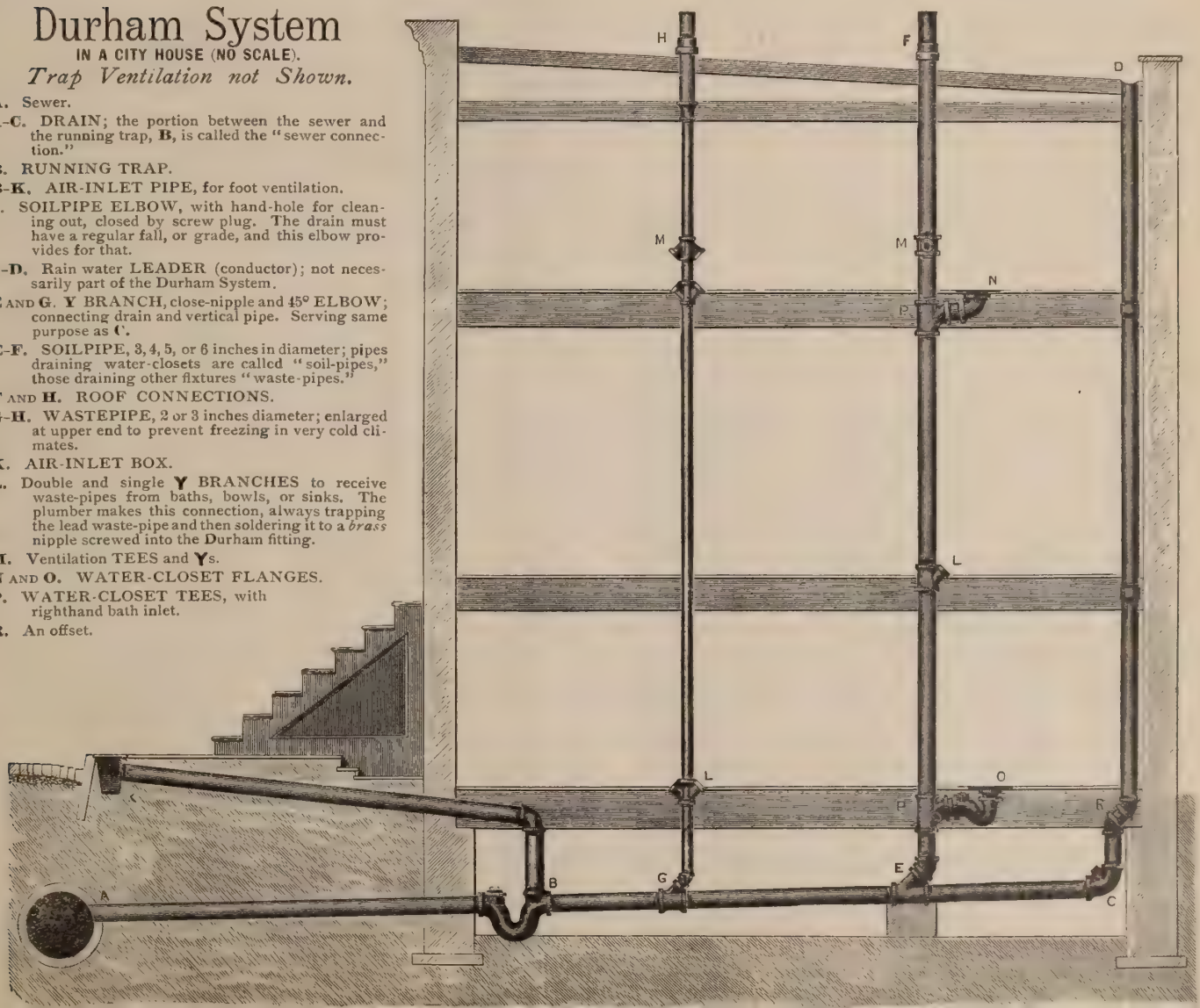
L. Double and single **Y** BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and **Y**s.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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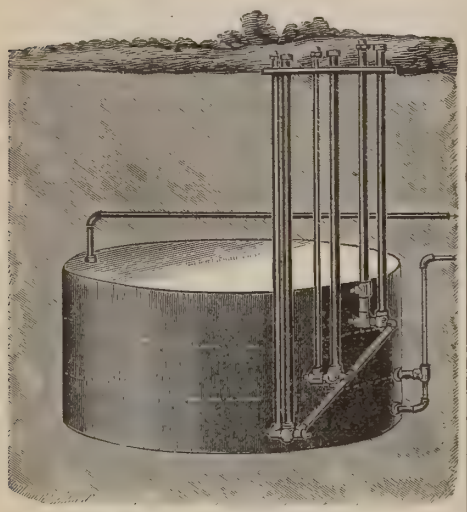

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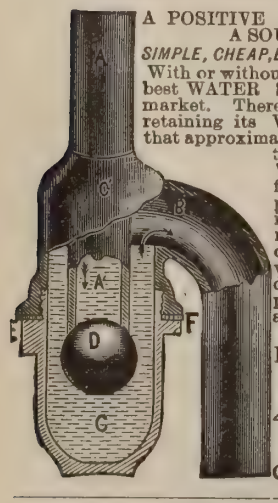

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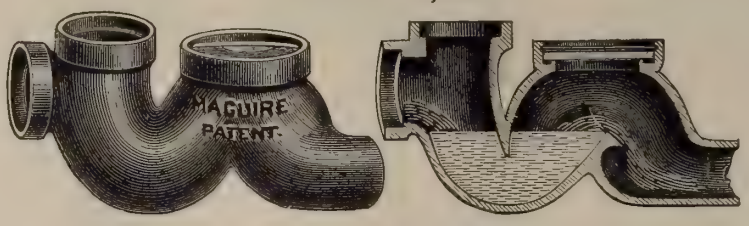

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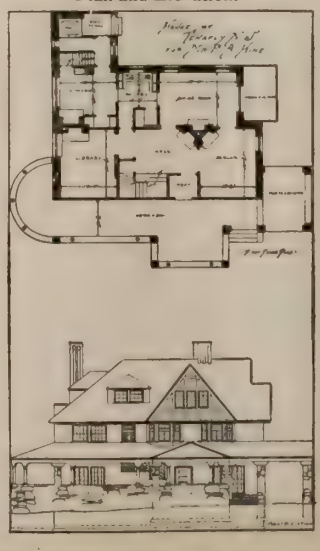

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THE suspension of the publication of the London edition of the *Hearld* was the subject of much discussion a short time ago. The cause that lead to its demise is probably not well understood, but we think there will be no doubt on this subject when the following extract from its columns is read. The *Ameriean Analyst* seems to think that no Journal could survive this suicidal act. At any rate the publication of this article seems to have put the *Hearld's* phagecytes to sleep. It says: "The discovery that swarms of beneficient bacteria called phagecytes inhabit the blood vessels and destroy the invading bacteria of disease, except when the latter appear in overwhelming numbers, bids fair to revolutionize the practice of medicine. Already an eminent physician has declared that in the future the aim of the medical man will be to strengthen the muscles, constitution and appetite of the phagecytes, so that they will be able to kill and eat a greater number of bacteria than now satisfies their wants; and he maintains that by kind and judicious treatment the efficency of the phagecytes can be greatly increased. But has he not forgotten the lesson so often taught by the domestic cat? It is her business to kill and eat the mice that infest her master's house, but if she is treated with injudicious kindness and fed with good food she disdains to sully her paws with mice and spends her time sleeping on the hearth rug. If our phagecytes are treated too well may they not prove as unprincipled as cats and allow our system to be overrun with all sorts of bacteria."

DOCTORS Scala and Alessi, says *La Rivista Internazionale d' Igiene*, have completed a series of experiments demonstrating that micro-organisms multiply in standing water, at the expense of the organic matter liberated in the water, this multiplication being but slightly influenced by a temperature a little above zero. They note the fact that micro-organisms diminish in water charged with carbonic acid. After demonstrating that light, movement, pressure, and cold have no influence on these micro-organisms, they experimented directly with carbonic acid, their experiments resulting in the proof of the lethal action of carbonic acid on the micro-organisms of water. This action they consider analogous to that by which other ferments die in liquids produced by themselves.

CHICAGO is an educator in the matter of sanitary plumbing From the letters and enquiries received from all over the country regarding the plan and rules for plumbing, we do not believe that any other city in the country is appealed to for information so much as this city is. Also the Chicago Master Plumbers, through papers read at their meetings, have added to the literature of sanitary plumbing and general sanitary intelligence, a better and larger portion than any other city in the world. This is saying a good deal for the Chicago plumbers, but we have followed the matter closely and believe it is true, and do not think the claim will be disputed.

LAST week we published an article from the pen of Mr. Whitsett, of Florence, Ala., in which much good advice was given to young men. His remarks concerning the "willing hand" were sensible and to the point. Last week's issue of the *American Engineer* contains an editorial, "Finish your work well," and directed towards mechanics, in which the following sound sense is found:

"Many mechanics seem to think that there is no moral responsibility at all resting upon them as individuals, or at least that deduction may well be drawn if we are to judge from their everyday deportment. They heedlessly pass imperfect work or material upon which they are engaged, well knowing that it is not of the same strength and durability as is required. As there is no particular benefit resulting to them from the exposure of a defect and no particular blame attached in case the defect proves disastrous, they make a very lame excuse for not caring to warn the unsuspicious of threatened danger. It will be observed generally, too, of this class of men, that they have but little care to finish their work well; any slipshod makeshift is equally as good with them as a carefully finished piece of work. A careless "that's good enough" is the only comment which may be excited if their attention be called to their miserable performance. Notorious as they may be for idling away the hours when they ought to be engaged in labor, and they do this with an easy conscience, and often waste material intrusted to them to manipulate simply because it costs them nothing. It may be remarked that these very same persons are generally the most strict in insisting upon the prompt fulfillment of contracts on the part of those who employ them, and are the most exacting in claiming all that legal enactments may award to them.

To mechanics we say: "Finish your work well and carefully complete each task as if upon it rested your sole reputation, upon it hung the jeopardy of human life, which you individually must answer for; instil into your mind as a part of your faith that an obligation rests particularly upon you to finish your work well."

THE weight of a crowd of men closely packed is about 84 lbs. per superficial foot.

NOTES AND NEWS.

There is a law in Spain requiring compulsory registration of architects. It has been in existence fifteen years.

The cheap tinware in such extensive use all over the country is said to be absolutely dangerous, the coating of the iron being adulterated with poisonous metals, principally antimony.

Mr. Frank Della Torre, of Baltimore, has invented an instrument which he calls the eophone, by which he claims that all sounds can be heard and located on the darkest night and in the thickest weather.

The balloon proposed for polar explorations is 99 feet in diameter and 500,000 cubic feet in volume. The journey is to be begun from Spitzbergen, and, with a favorable wind, is expected to last four or five days.

For the instant destruction of roaches, stir into a half pint of hot paste a dime's worth of phosphorous, adding, when cool, a quarter the bulk of grease. This should be placed where they frequent, and they will die while eating it.

The Italian government, after exhaustive experiments with oils, have ordered that all exposed parts of machinery are to be lubricated exclusively with castor oil, while mineral oils are to be used for cylinders and similar lubrication.

Some years ago glass-lined piping was used in this country for certain purposes, but improvements and increased facilities in manufacturing it have brought it prominently forward in Great Britain.

An English inventor offers a system by which coal-gas, compressed to one-eighth its natural bulk, can be carried about and utilized as an illuminant when desired.

Printing can be copied on any paper of an absorbent nature, by moistening the surface of the latter with a weak solution of acetate of iron, and using an ordinary copying press.

The experiments with a pendulum to visibly demonstrate the motion of the earth, formerly made by Francault under the cupola of the Pantheon, are about to be renewed on an even larger scale. The new gigantic pendulum has just been suspended from the center of the second platform of the Eiffel Tower. It consists of a bronze wire 115 metres long, with a steel globle weighing 90 kilogrammes at the end.

The curators of the New York Polyclinic announce that hereafter they will refuse to matriculate all persons who have not been graduated by some recognized medical college, or who have not obtained a legal permit to practice medicine, after two full years at such college.

A good many people spoil the effect of a good night's rest by the ridiculously heavy bed-clothes they use. Old-fashioned cotton quilts, or modern Marsala ones, are very heavy and of no use, as a thin covering to protect blankets from the dirt is all that is really necessary. Bed-clothes should be like body-clothing—light and warm. Many a bad sleeper would do well to see whether his coverings are not at the bottom of his restless nights.

A new way of annealing small pieces of steel is given by a writer in the *English Mechanic*. Heat the pieces as slowly as possible, and when at a low red heat put between two pieces of dry boards and screw them up tight in a vise. The steel burns its way into the boards, and, on coming together around it, they form a practically air-tight charcoal bed. When it cools off, the steel is apt to be found thoroughly annealed.

The importance of that class of journalism representing the various trades and industries is being more realized each year, and especially in the unparalleled progress of our country in commerce and manufactures in each succeeding decade. More than any other class of periodicals, our trade papers gather up for record and study facts and points that touch vitally every interest of the business community—interests that bear on the life of city and country, representing the thousands of millions of dollars that swell the enormous figures that make up the modern census reports of the nation, the wonder of the century in the world's progress.—*Exchange.*

It may be useful to notice that in modern granite architecture, as in the true granite style of the ancient Egyptians, simplicity in design should be *sine qua non*. Such a treatment certainly gives the most pleasing effect, and is in perfect accordance with the hard nature of the material. Any attempt at elaboration is altogether out of place. Overwrought granite is always painful to the sensitive eye—influenced, no doubt, by the remembrance of the vast amount of labor involved in the work. Overpolishing, too, has a peculiarly harsh and repulsive appearance, especially in the Aberdeen variety. A better and more pleasing effect may be obtained by employing a breadth of unpolished surface to heighten the value of the highly-polished portions.—*Stonemason.*

Asbestos in its various forms is a very useful substance, and can be employed very handily in many ways at the lecture-table and in the laboratory, says Professor Markoe. Shredded or carded asbestos will serve as an excellent filtering material, used just the same as paper pulp. Asbestos twine is used in binding together parts of apparatus exposed to fire and strong acids. The professor often prevented a crack in the neck of a retort or flask from spreading by binding it with asbestos yarn or twine, soaked in a solution of sodium silicate, and then treated with a solution of calcium chloride, a perfectly insoluble cement being thus formed. Asbestos wool mixed with solution of silicate of sodium makes a fire-proof cement of great strength; also serves to mend cracks in stoneware. It can be made insoluble by subsequent treatment with calcium chloride, silicate of calcium being formed. Asbestos paper and card can be obtained of all degrees of thickness, and can be well employed as substitutes for wire gauze and the sand-bath in small operations involving the heating of glass vessels. Asbetos paper and silicate of sodium are very useful for mending cracks in glass apparatus.

Mrs. Waller, in the *Nineteenth Century*, pointed out that it is still too much the custom to leave the upper part of the chest and the lower part of the abdomen exposed, and that hence come pulmonary affections on the one hand and bowel complaints on the other. "It is a fact that not only has the child less power of generating heat than the adult, but that it has also a much larger surface in proportion to the mass of its body, and will subsequently be far more susceptible to cold. Cold feet cause a large amount of indigestion, and exposure of the large blood-vessels of the thigh during childhood frequently sows the seed of kidney diseases, to develop in after life.

Speeking of the fuel-saving that has resulted from the burning of the escaping gas of the blast furnace under the boilers, Sir I. Lowthian Bell said in a recent address that apparent loss of 40 per cent. (by the old method that threw the escaping gases into the air) was incurred by what was considered the physical impossibility of bringing, in this particular process, the whole of the carbon burnt to its highest point of saturation with oxygen. Forty years ago this unexpected energy was not turned to any useful account. This loss was now avoided by burning under the boilers and in the hot-air stoves the carbon escaping from the furnace as combustible monoxide. By this beautiful application of what was a waste product, all the mechanical power needed at the works was obtained at the same time that the blast was heated, and these advantages were accomplished by a considerable saving of labor. With the present improved form of furnace, the coal consumed for these two purposes would be much less than formerly, but even then it would not be much short of 10 cwt. per ton of metal.

The *Maryland Medical Journal* discusses editorially the two varieties of megalocephalia, or swelled head. The congenital variety is so well known that it requires no notice. Concerning the acquired type of the disease, it is said that it affects persons of moderate abilities who have been suddenly, through the influence of friends, raised to positions of eminence and responsibility. It is said that cases are frequently observed among railroad officials or custom-house officers, and that they are occasionally met with in the Health Departments of our cities and states. The brains of the unhappy subjects of this sad complaint were formed and educated for the performance of quiet, unexciting labor in the small trades, and their possessors did well and respectably in such spheres of life. Being suddenly elevated, through politics or similar influences, to posts of great responsibility for which they were in nowise fitted, their brain-cells were unequal to the strain, and various unhealthy forms of thought and action made their appear-

ance. They began to act as if they were bosses instead of servants of the public, and as if mere perfunctory performance of their duties rendered them sacred and above criticism. The prognosis in this form is very unfavorable, hopeless in the congenital variety, hopeless in the acquired variety, unless the patient quickly returns to his former sphere and stays there. Apart from this, all treatment is useless.

NORMAN SHAW'S DRAIN-PIPE.

BY GEO. E. WARING, JR.

Mr. Norman Shaw, one of the leading architects of London, who made a very early contribution to the improvement of house-drains by a new form of disconnection outside of the house, has, within a few years past, suggested an improvement in underground house-drains, to which it seems well worth while to call attention.

All who are familiar with the difficulty of making tight joints with the earthenware pipes now used, and with the difficulties that architects and engineers experience in their efforts to get good work done in this direction, and architects and engineers themselves, who are conscious of their lack of certainty as to the character of this work, whatever care they may have given it, will readily understand the force and bearing of the objections to the method in use.

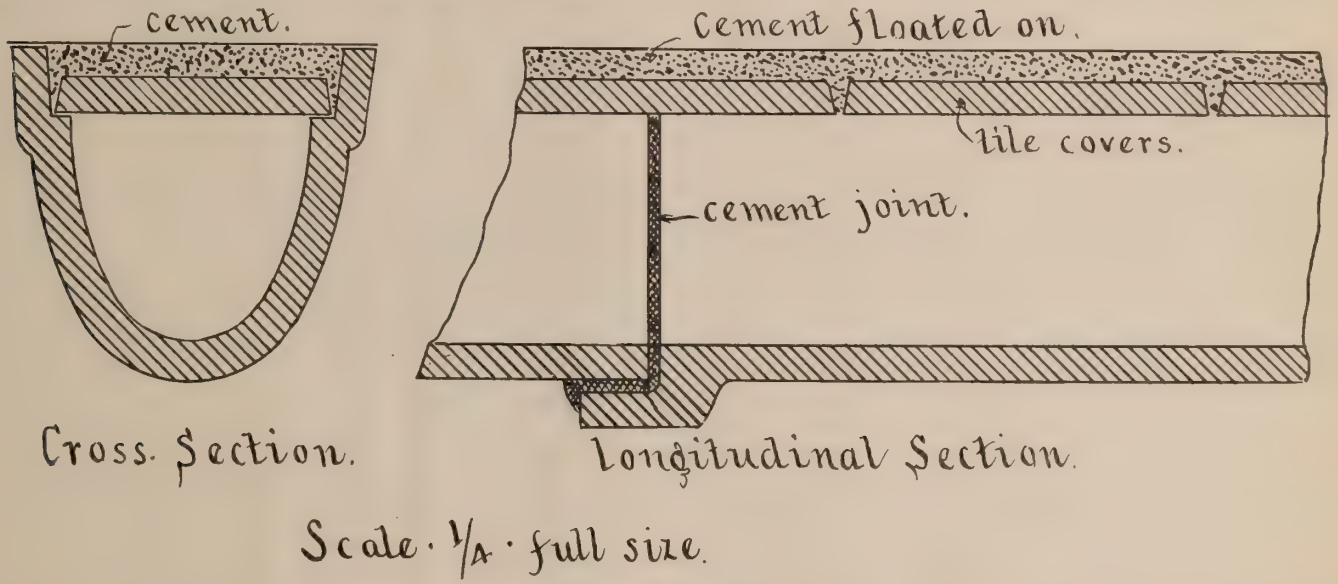
Vitrified pipes constitute the best material that we now have for continuing the drain beyond the point at which the iron pipe stops outside of the foundation wall, and if we could make sure that every joint was perfectly tight all around,—free from cracks and from leaks caused by the inflow of ground-water,—and that there was no rough intrusion of cement into the interior of the pipe, we need ask nothing more. Unfortunately, these are constant points of weakness and danger. The contractor's workman is often, if not generally, hurried and careless in his manner of doing the work. He does not himself know, because he cannot see, that the under part of the joint is all that it should be. He can judge of it only by feeling it with his fingers. Even though he leaves it quite tight, there is no certainty that, before the cement has set, ground-water will not wash it away and find entrance into the pipe, leaving a permanent leak. The condition of the interior of the joint no one can determine. Even in its best condition, there is an unfilled groove which may catch sticks, etc., and ultimately cause an obstruction.

Mr. Shaw's purpose was to avoid these dangers. He describes his device in a communication to the *Builder* (London) of June 30th, 1888, accompanying his description with a sketch showing his method. I submit both sketch and letter in the belief that you will consider them sufficiently interesting to your readers to reproduce them:

A NEW FORM OF DRAIN-PIPE.

Sir: Amongst the many difficulties that we poor architects have daily to contend with in our practice, I think there are none more serious than drains. They present themselves in all our works, so we have always to face them; and when it is considered what terrible troubles may and often do arise from any defects in laying, I may be excused for calling the trouble a serious one. Yet this is one of the parts of our duty in which our personal superintendence is not only very limited, but may be said to be almost impossible; for how can an architect say that he *knows* the drains in any of his works are perfectly laid? He may have taken every possible precaution; he may have employed the best of materials and tried men; and yet, in spite of all his care, defects may exist, arising, as I venture to suggest, from requirements totally beyond the power of the architect to control. To secure a perfect drain it is necessary that all the joints should be absolutely sound, but men are required to lay drain-pipes often at the bottom of a deep trench, in a position where they can neither see nor feel what they are doing. Is it wonderful if, under the circumstances, the joints of drain-pipes are often found to be defective, and that occasionally some lengths are found to be laid either flat or with a fall the wrong way?

I beg to lay before your readers a new form of drain-pipe, which I venture to believe will obviate all these difficulties. Instead of the ordinary socket-jointed circular pipes, I use a culvert of an egg-shaped section, open all along the top, with a rebated flange to receive covers. About the laying of these covers there is no difficulty of any kind, and when laid they can be inspected from end to end, each joint examined, and the uniformity of the fall tested to the utmost nicety. Should an imperfectly laid culvert be detected, it is easily taken out and another put in its place. (We all know the difficulty of getting out a defective socket-jointed pipe, and the bungling mess that ensues when this is necessary.) When the culverts are found to be all well laid, and when the whole has been examined, the loose covers are laid in and pointed with cement, and then the whole floated over with Portland cement as shown in sketches. It will be seen at a glance that a perfect drain has been made of the best possible section, and with the least possible trouble. If at any time a drain requires examination, it is at least as easy a thing to cut through the cement bed and chip out a covering tile as to cut a hole in a drain-pipe, as we now have to do. But I maintain that the vast amount of our troubles arise from drains not having been laid properly in the first instance. If well laid to begin with, and flushed at intervals, I cannot see that a drain ought to require attention for many years.



In the use of these culvert drains there is another very great advantage, viz.: that they can be laid at an early stage of the work, with the covers laid in loose and a board or two laid over to protect them from damage; they thus answer the useful purpose of draining off all slop and rain during the progress of the building. When the right time comes—just before completion—the loose covers can be taken off, the drain examined and any defects made good, and the whole sealed up.

I have had these drains made in the ordinary glazed earthenware, but I have also had some made in Portland cement, in which

a surface as smooth as glass can be obtained. I have not used any of these cement drains yet, but I should think that when the joints are neatly made the aspect must be a most fascinating one.

R. Norman Shaw, R. A.

29 Bloomsbury Square, W. C., June 25, 1888.

SEWERAGE AND WATER SUPPLY OF DAYTON.

The Dayton (Ohio) Board of Health in its last annual report makes the following suggestions regarding the sewerage and water supply of that city:

The most important want and necessity of the city of Dayton at the present time is, in our judgment, a thorough system of sewerage— some means by which the liquid waste material may be carried outside of the city limits, instead of being run into the ground on our own premises. Pure air, pure water and a dry soil, are the three great and needful things for the healthfulness of a city. The measure of a city's healthfulness is not her mortality rate, but is rather that of the healthfulness of her people and their freedom from disease. While the mortality rate of our city is low—much lower than many of the cities of this country—yet it cannot be said that its healthfulness is of the best. The diseases known as zymotic, viz: those that are caused by a specific germ, probably having their origin and being propagated by filth and impure air, are on the increase with us, notably diphtheria and scarlet fever. Of these two the number of cases reached almost epidemic proportions during the latter part of the year, and we wait with some degree of trepidation the hot weather of the coming summer; but it brings with it an increased repetition of these violent diseases. Statistics clearly show that this class of diseases flourishes where bad air and filthy surroundings are found; and this bad air, impure soil and filthy surroundings cannot help but exist where sewage matter of all kinds is run into the ground, and over which we build our houses, and eat and sleep and fancy ourselves secure. We do not desire to multiply words on such an important subject, involving so nearly the welfare of our city, but we do not wish to most emphatically assert that the present condition of things as regards the present soil saturation cannot help but be productive of great evil in the near future. We cannot leave this subject without expressing our thanks for the preliminary steps being taken by your body looking toward the establishment of sewerage. We bid you God-speed, and hope that you will push this matter to an early commencement and full accomplishment.

The water furnished by the city water-works is abundant in quantity and excellent in quality. We wish we could say the same of that coming from private wells, particularly the old-fashioned dug wells; of them there are not less than two thousand and fifty-five in constant use. The water from many of them is bad, decidedly bad, and dangerous, holding in solution much organic matter, sewage and germs of disease. Every one of them ought to be abandoned, as their use constantly endangers the lives and health of the users. In order that this might be brought about, we would recommend and urge that the price of water from the works to those that use it for drinking and culinary purposes only, be placed at a nominal figure—say two dollars per year. This would soon do away with the old wells.

THE MECHANISM OF INFECTION.

One of the most learned, ingenious, and valuable of the addresses delivered before the late International Congress, says the *Medical Bulletin*, was that by Prof. Bouchard, of Paris. Of the eight different processes by which it has been thought that the animal tissues were able to protect themselves against the action of bacteria, he dwelt upon but two as being efficient, viz., phagocytism and what he has denominated the bactericidal condition. In the former cellular activity prevents the development of micro-organism; in the latter a chemical condition is induced, which not only destroys the microbes, but retards the growth and multiplication, reduces their nutrition, and weakens their functions. Phagocytism is a general and universal process, a constant function during health. The bactericidal condition is accessory and contingent. Neither, taken by itself, is capable of preserving or restoring the integrity of the economy. It is, in general, by the concourse and association of the two processes that immunity is assured and cure produced. In vertebrate animals local injury excites an accumulation of those cells capable of migration,—the white blood corpuscles and the leucocytes of the lymph. By the side of this pathological diapedesis of white blood-cells there is constantly taking place a normal migration of lymph-cells toward the surface of the internal integument. This occurs especially in those places where microbes are able to penetrate an intact membrane, as in the pulmonary alveoli, the tonsils, and Peyer's patches. Now, even in health microbes do succeed in passing these boundaries, but they are immediately destroyed by the lymph-cells. Hence, although these organisms abound in the respiratory and digestive tracts, they are, in normal conditions, prevented from entering the blood. The normal blood, as Pasteur has asserted, contains no bacteria; but Professor Bouchard has seen them rapidly make their appearances in the blood of healthy animals when those are exposed to the action of causes which induce the development of infectious disease in man. The prolonged action of a moderate degree of cold is one of the commomest of these causes, and in animals subjected to such influences for a few hours the presence of bacteria in their blood could be demonstrated by culture. It follows that inhibitory nervous influences embarass normal phagocytism. A temporary suspension is followed by the passage of microphytes from the long, pharynx, or intestine into the blood. In a corresponding manner the same influences restrain the pathological phagocytism with which the white blood-corpuscles are concerned. Phagocytism, consequently, whether under normal or pathological conditions, is one of the manifestations of *vis medicatrix naturæ*.

Very slight differences of chemical composition of inert media suffice to render the growth of Microbes more or less active. This consideration helps us to comprehend that differences in the consumption of the humors of living animals may produce the same results. Thus, for purely chemical reasons, bacteria may be destroyed, dissolved, or inhibited in development; on the other hand, their activity may be greatly heightened, while between these two extremes every grade of variation may occur. A certain number of these results have been obtained by the culture of pathogenic bacteria in animal fluids which have been entirely free from cells. It has been observed that the blood of an animal naturally resistant to a certain microbe may, nevertheless, serve as an excellent culture medium for that very microbe. Moreover, the blood of an animal which is unresistant to a certain microbe may prove destructive to that microbe. These paradoxical facts prove that natural immunity does not depend upon the bactericidal condition, and that receptivity is not linked with the absence of that condition. It is with acquired immunity that the bactericidal condition is concerned. An infectious malady, when not fatal, produces at the same time immunity and a durable modification of the fluids, which it renders bactericidal; that is, capable of producing, if cultivated, an attenuation of a microbe of the same species which gave rise to the disease. This bactericidal condition does not depend upon the cells which may be present in the fluid. As regards five microbes it has been demonstrated that vaccination produces the bactericidal condition.

Bacteria act upon animals by means of the substances which they secrete. The intensity of the chemical action is proportional to the quantity of chemical substance produced. This quantity may be considerable owing to the immense rapidity with which bacteria multiply. There are now known eight physiological properties belonging to bacterial products, by which pathogenic microbes can influence animal bodies.

Œdema and supperation resulting from exudation and diapedesis are the expression of vascular reaction, but this reaction is not, according to Professor Bouchard, the direct result of the chemical action of the bacterial products upon the vessel. It is due to an active vascular dilatation, which places the vessels in the condition studied by Cohnheim as the stage preliminary to diapedesis. In the case of those diseases which develop without any local excitement at the point of introduction, the probable explanation is that their specific microbes secrete irritant matters, but that they also secrete a matter which prevents the occurrence of diapedesis. Such matter acts by paralizing the vasomotor centre. Therefore, while bacteria generate substances capable of producing local irritation, the vaso-dilator paralysis induced by another secreted product prevents the occurrence

of local inflammation, and particularly vascular dilatation, exudation, and diapedesis. For this reason they are unchecked by phagocytism, and left free to develop, multiply, and secrete. In addition, however, to those noxious materials produced by bacteria, others are formed which are useful to the infected system. Such are the vaccine elements of bacterlal secretions. The list of these is being constantly enlarged. They are elimited by the urine, and are not entirely removed prior to the expiration of fourteen days. Their action must necessarily be indirect, because their protective influence does not manifest itself until the fourth day after injection, when a great part of the matter is already eliminated. The immunity which they confer depends, in fact, upon the production of the bactericidal condition. The condition remains after the substance which produced it has passed out of the system. The nutritive type of the animal cells is definitely changed. Immunity is established somewhat slowly. If, when exposed to infection, the fluids are bactericidal, there is no growth, no development of microbes, and no disease excited. If, on the contrary, the fluids are favorable to growth of the microbe, development begins immediately, and the phenomena of disease ensue. If there is no irritation at the point of entrance of the germ the system loses the protective advantage of phagocytism. Fortunately, however, while the bacteria throw deleterious substances into the blood and tissues, they are secreting another substance the presence of which is not revealed for a certain number of days, but which penetrates the cells, modifies their nutrition, and, in fact, establishes the bactericidal condition. At this instant the disease has attained its acme and begins to decline.

We have thought fit to present to our readers the foregoing abstract of the views of the eminent French Professor on account of their scope and ingenuity, and the importance of the subject. As he himself remarked at the termination of his eloquent address, they are doubtless not exempt from hypothesis, but he believes that in essential points they rest upon a firm basis of experimental demonstrations.

WATER SUPPLY.

It is generally conceded that polluted water causes more typhoid fever than all other causes, yet there is scarcely anything about which people are so indifferent. The poisons which contaminates the water generally comes from the drainage of barn yards, pig pens, privies, sink drains, house refuse, stagnant pools, always found near the country home and too often near the well. Water from these nuisances are filtered through the soil into the wells, and the pollution is not detected by sight, taste or smell. In a recent annual report from the board of health of one of our eastern states, in an account of well water containing 49.2 grains of solids per gallon, yet the pollution could not be recognized by the senses, and several persons had died from its use before the cause of sickness was discovered.

There exists a very wide spread and serious error regarding the soil as a filter. It is supposed by many that water is "purified" by the soil it is filtered through. Water is a solvent and, instead of being freed from its impurities by the soil, it takes up and carries off whatever the soil may contain. Water in the well may be as clear as crystal and teeming with disease germs and injurious matter. Kitchen, bed room and wash waters should be drained at least three hundred feet away from the well by means of water tight drains. When water is suspected of being contaminated to the least degree, it should be boiled, without any exceptions, before being used. Merely boiling is not sufficient. It must be allowed to boil for at least twenty minutes. Many disease germs resist high temperatures for a short time.

The idea that freezing purifies water is also an error that results in much mischief. Typhoid fever germs have been known to lie in snow and ice all winter and have sufficient virulence to produce the disease in the spring. These germs, with many others, are found in ice that has been frozen for months, and a few instances are on record of their being found in the center of large hail stones, frozen in the higher atitudes of the air. Another serious mistake is made in depending on filters to free water from disease germs. It has been demonstrated by actual experience that filters fail to perform this office. Disease germs will go wherever water will, and it has been found that filters act as a kind of culture ground for germs. They multiply in the filtering medium and increase in the filtered water by being washed through. If the filter retards their passage at all it is for but a very short time, after which their number very rapidly increases.

In the country home where there is no general source of water supply, each family must adopt the means of maintaining a pure supply of water. Do not depend on mother earth. Kind as she is she cannot perform services for which she was not intended. Keep all pollution away from the well. Do not allow any waste, refuse or offal to drop on the ground within three hundred feet of the well or spring. Use water freshly drawn. It, like everything else, dies and will become foul with decay when stagnant. Water is a great cleanser and a convenient hygienic agent when properly used, but at the same time it has a greater capacity than almost anything else for all kinds of impurities.

METHOD OF VENTILATING SCHOOL ROOMS BY WINDOWS AND FIREPLACES.

Undoubtedly the ideal plan for warming and ventilating houses includes a fresh-air shaft, bringing down the air from the top of the building, heating the same, and forcing it into the school room by a fan moved by steam or other power. The feet should be kept warmer than the head, consequently the foul air flues should be placed near the floor. The ideal plan is generally considered an expensive luxury, too expensive for use in most places. I can remember that twenty years ago many of the buildings in Chicago were heated and ventilated on this plan. By simply turning a register, the inflow of hot air could be stopped at once, and the inflow of fresh cool air substituted. The steam engine which furnished the hot air was placed in a small building just outside the building used for school purposes. I have never inspected schools elsewhere that were heated and ventilated in so satisfactory a manner.

The brief remarks which I shall make in this paper are devoted to the question of interest in the great majority of school houses in this country—houses that depend on windows and doors and chimney flues for their ventilation, and for heating, depend upon stoves or hot-air furnaces, or steam coils. The universal tendency when the air of the school room becomes too hot is to raise a window and let in the cold air from the bottom. The consequence of this is a direct draft upon the backs or shoulders of pupils sittting near the window. Pupils at a distance from the window get some of the fresh air without danger from the current of air caused. It seems to me that very many cases of ill-health in later life can be traced back to carelessness in this matter of direct ventilation from the window upon the pupil. The seeds of future rheumatism were then planted. Rheumatism, it is well known, leads to heart disease. In case the lungs are the weakest point, consumption may set in first, especially where the effect of sitting in a draft of air produces a bad cold instead of rheumatism.

Inasmuch as the cold stream of air falls to the floor on entering the room, and diffuses itself around the floor, it tends to produce cold feet, hence the ventilation of the room from the bottom of the window is sure to be inimical to the health of the pupil.

But the child must have fresh air. Foul air deteriorates the blood and lowers the tone of the whole system, thus inviting disease. The child must have fresh air, but the air must be introduced through the top of the window, and not through the bottom. This is the point that I wish to emphasize. If the window is not constructed so as to be lowered from the top, it can easily be changed. A portion of the supports of the window can be cut out with a chisel, so as to allow the upper sash to be lowered to the distance of one foot or more. Then two buttons may be fixed, one of which supports the window within one inch of the top, and another that supports it when it is lowered a foot or more. This change should be made in all the windows, and not merely in a few of them. Every school room should have at least four windows. Each of these four windows should be so constructed that the upper sash may be lowered.

In cold, sharp weather, or very windy weather when the air is mild, the upper sash of each of the four or more windows of the school room should be lowered one inch from the top. The cold

air from without enters the space above the window and meets the hottest air in the room. It is heavier, and descends toward the floor, creeping down the side of the window and the wall of the room, and becoming heated in its passage. During its descent it also diffuses itself more or less, and in no case does it strike the backs or shoulders of the pupils, provided that there is an aisle, as there ought to be between the pupils' desks and the wall of the room. Moreover when it reaches the floor it has become so much modified and warmed it does not cause a cold chill to the feet of the children.

If the weather is warm or mild, and there is little breeze stirring, the windows should be lowered from six inches to a foot. This will introduce a much larger inflow of fresh air, but it will hold its course to the floor near the wall or down the window without striking the shoulders of the pupils. In case, however, of cold weather, or of windy, mild weather, the volume of air pouring through an aperature a foot wide would be projected forward into the room like a cataract, and would reach the pupils and do them harm. Every one knows that the hot air rises toward the top of the room and remains as a sort of reservoir of air above the point at which fresh air is introduced. When the window is raised from the bottom and not lowered from the top, the persons seated on the other side of the room not affected by the inflow of air, feel the oppressing effects on the body of stagnant air in the top of the room. This is instantly removed upon opening the ducts at the top of the room, because all the air in the top of the room is set in motion by the process.

I have said that all of the windows, and not some of them, should be lowered from the top. It will not do to fix one window alone, even suppose that it is sufficient for the purpose of ventilating a whole school room. It will do something, but what it does will not be well done. For in order to effect the air of the whole room, it will be necessary to lower the window too much, and the consequence will be the creation of a too brisk current, the formation of a cataract of air, as it were, which will flow outward from the wall into the school room so far as to strike the pupils sitting nearest that window. All of the windows should be lowered, and no more than is necessary to produce the change of air in the whole room by the descent of a thin sheet of cold air down the windows and the wall to the floor.

This method of ventilating the rooms is not a matter of mere theory, but has been tested by me through many years of practice. Any school room that has four windows in it may be ventilated by this process in a fairly serviceable way. But it is quite important that there should be ventilating flues at the bottom of the room opening into a large ventilating flue surrounding the smoke stacks which carry off the heat of the furnace. There is a sort of sour school room air which the school visitor remembers vividly. This school room smell cannot be removed effectually except by ventilators at the bottom of the room. The ventilation by means of the tops of the windows that I have already described gives a fair supply of fresh air to all in the room, but it is not quite adequate to remove this school room smell here spoken of. The ventilating flue at the bottom of the room opening into the smoke stack is supposed to draw the air out of the bottom of the room by the draft of the heated air ascending the smoke stack. By the term 'smoke stack" I refer to the iron pipes within the chimney through which the smoke and gases from the fuel escapes up the chimney. A space left around this smoke stack, and open all the way to the top of the chimney, furnishes the ventilating flue which is found to do the best service in school houses. When the building is not heated by furnace, and the volume of air in the ventilating flues is not heated, there will not be a draft sufficient to suck out the sour and fetid air from the bottom of the school room. An open fireplace in some part of the school room will answer this purpose admirably, if a small fire is kept in it constantly, even in summer. A kerosene lamp of small size will do wonders by causing an ascending current of air which draws out the bad air at the bottom of the room.

In case the room is heated by a stove, the stove should be a large one, so that the door may be left open after the coal is ignited. The draft which carries the steam and gases up the chimney also draws out the bad air from the lower part of the room. In case wood is used, and an open door occasions too rapid combustion of the fuel, some other plan must be adopted. The old Franklin stove or fireplace makes the best ventilator, though a poor heater. Its heating capacity may be increased sufficiently by lengthening the pipe and carrying it around the top of the room before connecting it with the chimney.

I should have said above when the outdoor temperature is 80 degrees Fahr. or above, the windows may be raised from the bottom a foot or so, and lowered from the top as much as possible.

There are devices of oblique boards placed at the bottom of the window or at the top of it, which are intended to deflect the current of air upwards, and thereby prevent its injurious effects on the shoulders of the pupils. I do not doubt that these devices are of some use, but in my experience I have never known them to be so good as the plan to lower the window from the top simply—that is one inch in cold weather and a foot or more in mild weather, the reason, I suppose, being this: That the oblique board serves to prevent the inflow of air when there is no breeze stirring outside the school room. For air, when still, refused to climb over the oblique board, just as water or any other fluid refuses to climb over its bank. The oblique board arrangement will work only when the wind blows toward the school room.

Of all methods of heating the school room by direct radiation, hot water pipes extending around the room, connected with means of admitting fresh air under the pipes, is the best that I nave seen. The steam coil is apt to overheat and injure the quality of the air, although this may be rendered unnecessary by a more liberal supply of coils. The stove and the fireplace heat the school room unevenly, but they furnish a natural means of ventilation, while the steam coil or the hot water pipes demand some auxilliary process for ventilation—a process which is sometimes neglected, however. If ventilation is not provided for, the steam or hot water heating apparatus may prove quite injurious to the health of the pupils.—*W. T. Harris in Architecture and Building.*

BRICK AND BRICKLAYING.

We find the following practical thoughts from a very practical man, J. W. Crary, in the *Clay Worker* for September on bricks and brick making. Pure silicate of alumina is first-class clay, but it is rarely to be found in quantities in convenient places for brick-making, as to make it available; therefore, the great proportion of brick must be made of clays more or less impure, and the character of these depends mostly on their color and fusibility. As a rule, the most infusible clay will make the best brick. This kind of clay will shrink when drying, a great deal, but will not shrink or settle in burning. There are large beds of this kind of clay in West Florida, and in other sections on the gulf coast. These clays are of a cream, or straw color, when thoroughly burned. The great proportion of brick made are red, or brown, when burned, and shrink in burning, and in order to make the strongest and most durable brick, should be burned until the iron and alkaline substances in the clay are well oxydized. The common cherry red front brick, or what may be called hard brick, are not at their best, until they are burned so hard that they turn quite dark, or to what are called "paving brick"—this is not a popular color, though the best brick.

The time is not far distant, when none but the best hard brick will be used in the proper construction of brick buildings of any importance.

Storms or cyclones have been so frequent and destructive of late years, that the very best building materials, and the best modes of putting them together will be demanded.

To say that salmon brick and bats will do to put in a wall that requires sufficient strength to resist the pressure of storms, is to assume that absurdity and consistency are equal terms. Salmon brick and bats may answer the purpose where a low thick wall, as for instance, a steam boiler wall is wanted, but where very great resistance to pressure of any kind is required, the strongest and best brick should be used.

FOR GREAT STRENGTH THE VERY BEST MORTAR SHOTLD BE USED.

It is a great fault, and so, almost without exception, to use very weak, bad mortar in laying brick. The terms "good mortar," "fresh lime and clean sand," etc., are not sufficiently explicit. The name of the best well-known lime should be specified; then the specification should say, that such lime shall be slacked in

enough clean water to make the lime into a thin putty, then run off into a large vat, and there remain at least one week, covered with water before turning into mortar. Then pure, sharps and should be used. It should be free from vegetable or mineral matter, and to insure this it should be screened through a fine sieve, and washed, or, what is better, it should be put into an oven or dry pan, and stirred, hot enough to burn up all vegetable matter, and indurate clay matter in the sand, to the hardness of salmon brick; then three measures of sand should be mixed with one of lime putty, and the whole perfectly tempered and co-mixed; then as it is used, one measure of the best hydraulic cement should be added to four measures of the lime and sand mortar, and well mixed together, and used immediately by the bricklayer, as it will not do to let it stand long enough to "set."

THE ONLY PROPER WORKMANLIKE WAY TO LAY BRICK.

It is the universal practice to lay brick comparatively dry; this is one of the great faults and mistakes of builders. A dry brick will absorb a pound of water, and when it is seen that a joint of mortar between two brick cannot have a half pound of water in it, the fact that the mortar is dry in an hour after being spread, is perfectly clear; and when it is considered that it is the water in the mortar that causes it to set, and harden, the most stupid mind can see that there can be no cementation or binding principle left in the wall. Now to prevent this loss of the water of crystalization, and give it time to harden and adhere to the brick, it is plainly obvious and conclusively true, that the brick must be well saturated with water, before they are laid. It is not sufficient to shower a little water over the surface of a pile of brick, as is generally done, even where it is specified that the brick shall be wet, but the brick must be wet through the whole body, so that when it be laid in its bed of mortar it will not absorb any water from it, so that the drying of the wall will be so gradual and slow that the mortar will thoroughly crystalize.

PRESERVING A TRUE BOND IN BRICKLAYING A PARAMOUNT NECESSITY.

One of the most perfunctory slipshod things in bricklaying is to spread mortar unevenly, and to pay little or no attention to keeping a proper and uniform bond. The common bricklaying will break joints and keep a bond on the outside of walls, but after that he cares little or nothing about joints or bonds. In "filling in," between the outside and inside lines, no kind of attention is ever given to the bond. Mortar is spread carelessly and unevenly, then bats and whole brick are dashed down, often not bedded, and "joint over joint," so that the entire "filling in" affords no strength whatever to the wall, and is sometimes a positive injury, as its want of bond and the uneven bedding may throw a lateral strain against the outside part of the wall.

WALLS TO STAND CYCLONES AND EARTHQUAKES.

Walls built in the best manner with brick, thoroughly bonded and bedded in every direction, as I have indicated, and "flushed" with good mortar, after standing six months, will be as compact and strong as stone, and if a dwelling, two stories high, be well built, with inside jambs or pilasters projecting from door and window jambs, so as to brace the wall from foundation to top, in the manner I have suggested, it would stand the pressure of storms and the tremor of earthquakes, unless of a very violent kind, without any serious damage. Vertical and horizontal iron anchors, laid in good brick walls, in parts of the country subject to storms, would reduce danger of life to a minimum.

PROPER WAY TO PUT IN IRON ANCHORS.

In the construction of a brick wall there should be as much "dead" or solid wall perpendicular and horizontal as is consistent with real necessity. To violate true architectural rules, and proportions for strength, in order to give to buildings ornate picturesqueness, is fopish; and is both bad taste and bad economy. Proportions for strength, durability and utility, are the three great considerations in building. Flag galvanized bars or iron can be laid from corner to corner, horizontally, in all straight sections of walls, then perpendicular anchors, from foundation to top, can be conveniently worked in the solid parts of the wall; they can be in pieces of convenient length for the mason, and joined in any simple proper way, so that when a wall is well built and complete, and the roof properly anchored to the wall, and the wall has had time for the mortar to "set," no ordinary storm will seriously effect it.

If those who desire safe and substantial dwellings will give this subject thoughtful and skillful attention, much painful apprehension and liability to fatal danger will be avoided, and the first extra cost will be fully compensated by the ready demand for such houses. No tenant, or investor, would hesitate in making a choice between a house built in the way I have indicated, and one built in the ordinary careless manner, looking only to show, and present profit.

I do not mean to entirely exclude bats or salmon brick from use in building. Soft brick and bats can be used in inside chimneys, and hard bats can be laid in underground foundations, but should be well bedded and flushed with mortar.

REPRODUCTION OF BACTERIA.

It has been very reliably determined that bacteria, when placed in the best conditions for their activity, will double their number every hour. In most favorable circumstances it will then be seen that a single bacterium will, in twenty-four hours, produce 16,777,220 of its kind. In forty-eight hours, from this single source, the number of bacteria would amount to 281,500,000,000, a quantity sufficient to fill a pint measure, all produced in this short time from a single micro-organism measuring but 1-15000 of an inch. Fortunately, these conditions do not often exist. The reproduction of bacteria is opposed by many kinds of forces and they have a continual battle for existence. In regard to the disease producing or pathogenic germs, it is important to understand what forces or agencies will retard their multiplication or wholly destroy them. In emergencies chemistry is resorted to and antiseptics employed, but in the proper prevention of disease such emergencies should not be allowed to arise. Sunlight, pure air and thorough cleanliness are natural enemies to disease germs. They cannot flourish where they have not their proper food, and that is found in dampness, darkness, mold and filth. Keep the habitation flooded with sunshine and pure air, keep away all filth and dampness, and the germs of disease will find no foot-hold, no nidus in which to breed, or food on which to grow. Nature is struggling all the time to keep her domain healthful, and a fit habitation for man, but man shuts out the air and light, contaminates all things about him, and disease is the reward of his recklessness and neglect. There is more health in a sunbeam than in drugs, and more life in pure air than in the physician's skill. The sunlight may fade your parlor carpet, but better that than have disease fade your cheek. The wind may "tan" and "freckle" the face, but it is better tanned and freckled than thin and sallow. Help nature to keep your habitation healthful by allowing her forces an opportunity to operate. There is more health about you than disease. Health is man's natural condition. He has to violate some law before the penalty of disease is inflicted. He can place about him such conditions that disease germs will evade his system, or he can live amid surroundings so pure that health will bless him both in his freedom from physical ills and in the sweet consciousness of right living.

UNBURNED GASES FROM STOVES.

At a recent meeting of the British Association, Mr. Thompson, of Manchester, read a paper on the "Unburned Gases contained in the Flue Gases of Gas Stoves and other burners," of which the following is an abstract, as published in the *National Druggist*:

The author said that the only burner in which he found that perfect combustion was effected was that of a paraffin oil lamp when the flame was not turned full on; but when the flame was turned full on the burned gas was liberated to the extent of 12 parts of carbon and 3 of hydrogen for every 1,000th part of carbon in the oil completely burned. The next nearest approach to complete combustion was in an Argand gas burner, When the gas was not allowed to burn full on, no carbon and ¼ of a part of hydrogen was left unburned per 1,000 parts of carbon burned completely. When the gas was turned full on, 1-10th part of carbon and 2½ parts of hydrogen escaped unburned per 1,000 parts of carbon completely burned. Next in point of producing perfect combustion was the Bray's ordinary flat flame burner, burning in the open air, when 12 parts of carbon and 1 of hydrogen escaped unburned per 1,000 parts of completely burned carbon in a heating stove with three luminous flat flame burners;

97 of carbon and 12 of hydrogen escaped unburned in a stove where eight Bunsen burners played on fancy ironwork in front; 146 of carbon and 7 of hydrogen escaped combustion in a stove in which asbestos projecting from a fireclay back was heated by twenty Bunsen burners; and in a stove in which the burned gas rises to the top of an iron chamber, and passes into the fire from the bottom of the chamber after giving its heat to tubes set in the chamber through which cold air passes to be heated, as much as 226 parts of carbon and 28 of hydrogen escaped combustion per 1,000 parts of carbon completely burned. The president said that it was most important to know whether carbonic oxide resulted from the burning of gas in stoves or from illumination. An extremely small quantity of carbonic oxide in an atmosphere breathed by people was highly dangerous. He spoke with some knowledge and experience of the fact, for some years ago he was very nearly killed by carbonic oxide. He was called in to investigate a case of poisoning, which afterwards turned out to be by carbonic oxide. A man was found dead in a room ten feet square, and he (Professor Thorpe) attempted to reproduce the condition prevailing in the room by using a blowing engine. After it had been going for twenty minutes he entered the room, but he had only proceeded half a dozen steps when he felt his knees give way. He fell down unconscious. Some friends were fortunately near and rescued him. Dr. Jacob said Mr. Thompson's paper was a valuable one, but he thought the experiments might very properly be continued, for the amount of combustion which took place in an ordinary gas flame differed according to the pressure of the gas. Usually a burner intended to burn three feet of gas in a given time had five or six feet pass through it. Generally speaking, people who paid £10 gas bills got only £5 worth of light. He had that on the authority of one of the largest manufacturers of burners. The question so far as gas cooking stoves was concerned was of such sanitary importance that it would be worth while appointing a committee of the association to investigate the conditions under which they were used.

THE OUTLOOK FOR WESTERN ARCHITECTURE.

With the increase of population, wealth and railroad communication, the early dwelling still retaining its essential structure, grew into more ambitious expression. Its owner, following either his own taste or the equally untrained taste of the most available carpenter or "mill man," adorned it with all sorts of "ornamental" devices in woodwork—open-work scrolls under and above its gables, jig-sawed crestings on its ridges, and wonderful frostings and finials on its gables. The architraves about its windows were no longer content to be of simple boards, but were decorated by rosettes, star-shaped ornaments, and all kinds of forms, suggestive of nothing so much as "nudels" in a German soup. The clapboards or matched ceiling covering it were laid in all directions, sometimes horizontally, as often diagonally in one or two directions, or else in basket fashion, the joints being at right angles with each other.

Take it all together, the outlook for western city houses seems most promising. Western people themselves are becoming, and will still more become, almost ideal clients. It is true that, as in the East, Western city dwellings have not escaped the deadly touch of the "know-it-all" client, nor of the man who is "building the house to suit himself," nor of him who "is going to live inside the house, not outside," and who is therefore loftily indifferent to the street aspect of his house; but each, even the last person, is becoming infrequent. In the past, and to some degree at present, Western cities have been and are influenced by men whose lives have been absorbed by things too material to leave them much leisure for art; but even in the case of such men there is a marked indisposition to dictate in directions where their knowledge is incomplete. They have a large openness and unbiased attitude of mind, and a genuine and earnest desire to "get the best." In the West is less often found than in the East the "æsthetic crank," and it is also true that life in the West is less conventional, freer, less restrained by artificial restrictions than in older communities, and the true nature of people and things is perhaps more frankly expressed.

One feature in the plans of Western city dwellings is their openness. Not only are the windows upon the average larger than in the east, but they are more frequent, as are also bay-windows, oriels, etc.; while in the general plan rooms are more closely related, openings between rooms wider, and single swinging-doors less frequent. Several dwellings in Chicago—and there are many in other Western cities—have no doors whatever in the first story, except those at the entrance and between the dining-room and butler's pantry, curtains being exclusively used. This is certainly carrying out the idea of openness to the extreme, as it is the destruction of all privacy, and of all those suggestive glimpses upon which so much of the artistic effect of a house depends.—*From "The City House in the West," by John W. Root, in Scribner.*

MODERN SCHOOL HOUSE DESIGN.

The issue of October 4 of *Architecture and Building* was a special school issue, and a very valuable one. It related to one important subject, and treated it in an elaborate, intelligent way. The following is reproduced from that issue:

The study of school-house design is based chiefly on the unit of all school buildings, viz: the single school-room. Whatever is most appropriate, most healthful and best adapted to teaching is evidently suitable for many such units assembled under one roof—the only variability lying in the purpose of the room itself.

The most important of all considerations in any school-room is the method by which it is lighted; second, the amount of floor space to each pupil; thirdly, the ratio of cubic feet of space to each pupil; fourthly, the methods of heating and ventilation, and lastly architectural design.

Dr. Lincoln states that the ideal room is lighted from one side only, viz: the unilateral system, and its size is limited by this condition. The height should not exceed 14 feet; in this dimension almost all the authorities are agreed, 12 feet being the minimum, and 13 to 13½ being preferred by most teachers. The unilateral system limits the width of the room to 24 feet. The room should be oblong rather than square. A room 24x32x14 feet gives a cubicity of 10,752. The best ratio for a school room is as 3 to 4 for width and length.

Dr. Philbrick says that the tops of all windows should be square, not more than 6 inches from the ceiling, the bottoms being at least 3½ feet from the floor, equally spaced, not grouped, with transom sashes hung at the base, above the sliding sash; not over two windows in the back are admissable. They should be placed as near the left hand corner as possible, consistent with a good external appearance. Some authorities claim that the window space should not be less than one fourth to one-fifth the floor space. We are inclined to believe that this is excessive. Dr. Philbrick considers one-sixth of the floor space a sufficient ratio for the window space, and this is in accord with the most approved current practice. One authority claims that each pupil should have 2½ square feet of glass. The highest authorities in school hygiene claim that each pupil should have from 300 to 350 square inches of glass. Other authorities claim that windows should be closely grouped, not distributed along the wall. No pier of masonry or woodwork should divide a window. The light should be *massed*, not divided. Here we have a conflict of opinion. Where school rooms exceed 13 feet in height, complaint is sometimes heard of their acoustic qualities. If the height exceed thirteen feet and there are decided echoes, rounding the corners and coving the ceilings will generally destroy them. There should not be over four panes of glass in a window. Multiplied cross-bars obstruct light and cast shadows.

The minimum allowance by hygienic authorities is 15 feet of floor space and 210 feet cubic of air space for each pupil; the maximum is about 21 feet of floor space and 300 cubic feet of air space. In the room whose dimensions are given above consider the air in the room to be changed once in ten minutes, or six times an hour, the hourly supply would be 65,512 cubic feet of fresh air. The quantity required by each pupil being placed at 1800 cubic feet, the amount cited would be sufficient to accommodate 36 pupils. To accommodate a larger number of pupils and fulfill the maximum requirement, the air would have to be admitted more rapidly.

The method adopted in heating will, to a large extent, influence the character of the design of the building. In a small school furnace heat, carefully arranged, fulfills every hygienic require-

ment; this implies a well-studied system of ventilation. For large buildings, heating by "direct radiation" means the use of steam coils placed in the rooms to be warmed, but it is difficult to provide adequate means of ventilation. Indirect heat means heating by coils in a separate chamber and the distribution of the *warmed* air, by means of ducts, to the various rooms. This method involves a carefully-elaborated system of extracting the foul air of each room, in order that space may be permitted for the warm air to enter and do its work. This implies an extensive duct or channel system, a large evacuation chamber, or a series of extraction flues, all of which require a vast amount of space within the building, and form an important element in the architectural design. What is known as direct-indirect heating is not approved of by hygienic authorities for class-rooms alone, but may be used where the direct heat supply is confined to the halls and indirect to the class rooms.

There are three kinds of clothes-rooms in vogue. First, one room for the whole school or several classes; second, a room attached to each school-room; third, arrangements within each school-room, either wardrobe or pegs on the wall. The second kind is the one most approved of, provided that the sexes have separate rooms. Generally this separation may be obtained by a low partition not exceeding six feet in height and running to within six inches of the floor. The double shutter style has been found to work admirably. While open to admit of the free circulation of the air, the fixed shutters are arranged so that no mischievous conduct on the part of the boys can annoy the girls in the adjoining cloak-room. The third sort is the most objectionable of all methods, and is now practically abandoned in our latest schools.

Two modes of seating are in vogue. The combination desk has a seat attached in front; the front of each desk serves as the back of a seat. In the other type the seat and desk are separate. The former is dual as to seating, the latter single. The most approved single seat has the chair mounted on a single cylindrical iron support. The single desk, with separate chair, is the best mode. It is difficult to proportion the size of the chairs and desks to the pupils for whom they are intended. In each graded school there should be at least three sizes of chairs adopted.

Whenever practicable, the ground plan should be so oriented that the corners of the structure shall point to the cardinal points; this insures the admission of the sun's rays in every window at some time of the day. Stairways should be fire-proof if possible, be isolated by solid brick walls on at least three sides, and lighted from the outside. The architectural design of the outer structure should conform strictly to the sanitary and hygienic needs of the school. It should be characteristic, said one great writer, neither ecclesiastical, Hellenic nor commercial. It should never exceed three stories in height above the basement; as a rule, school rooms should not be placed higher than the second story. The general composition should be simple and dignified; picturesqueness may be admissable in a two-room rural school house, but in a large building never. Roof-lines should be gentle and symmetrical. The walls may be tinted, but not the ceiling; both wall and ceiling should have washable surfaces. The floor should be of hard wood or yellow pine, and oiled so that it may be cleaned up with a damp cloth. In general one may conclude that the most satisfactory method of designing a school building is to make a careful study of the floor plans as evolved from the requirements of the problem and let the elevations rise naturally from the plan solution. The simplest elevations will be the most satisfactory, provided every internal reasonable need is satisfactorily fulfilled, for then the building will be characteristic, and its symplicity of treatment will be commendable to the most highly cultivated æsthetic taste.

CHICAGO MASTER PLUMBERS' ASSOCIATION.

The regular bi-monthly meeting of the Chicago Master Plumbers' Association was held in Grand Army hall on Thursday evening, November 13th. In the absence of the president, Mr. Hugh Watt, who is still afflicted with rheumatism, the vice-president, Mr. David Whiteford, called the meeting to order.

The association was favored with a paper by Robert Griffith, on the subject of "Plumbing and Sanitary Applicances in the Year 1900." A communication was received from the Ladies' Auxiliary Society of the Chicago Master Plumbers' Association, asking the privilege to entertain the members of the sterner sex on the fourth Thursday in November.. The communication was received and a great time is expected by the Chicago Plumbers on this particular evening.

The application for membership of J. F. Dalton was read to the association. Mr. Culloton and Mr. Rock were appointed on a committee to visit Mr. Dalton concerning his application. Robert Griffith read a telegram from James O'Neill, of Lincoln, Neb., who wires for three first class plumbers to whom he agrees to pay four dollars per day. A general discussion was held on the question presented by Mr. Gsiffith's paper. Mr. Hamblin, Mr. Bowden, Mr. Whiteford and Mr. Griffith took part in the general discussion. Mr. Bowden entered his protest against the catch-basin and says that this nuisance must go.

The association adjourned until Thanksgiving evening when the ladies will entertain the members at Grand Army Hall.

AMONG THE PLUMBERS.

J. Degnan and John Hayes are doing a good business at their new stand on State street. Mr. Hayes worked for P. Sanders & Sons for a long time before opening up a shop for himself.

The rapidly increasning business of the L. Wolff manufacturing company, has necessitated an enlargement of its plant and a handsome three-story brick factory will be erected for the firm at numbers 806 to 822, Carroll avenue. The entire cost of the building will be about $40,000. Furst & Rudolph, the well-known firm of architects, have prepared the plans for this new building.

Mr. E. Fry will in the future, send in plumber bills to the citizens of Galesburg, Illinois.

Watson & Davidson at 301, Wabash Avenue, have quite a number of new contracts on hand and are doing a large amount of jobbing business.

P. Sanders & Sons are very busy with new work and in getting ready to move into their elegant new appointments at 1314 Wabash Avenue, Mr. Sanders hopes to be well settled in his new store by the middle of next month.

Harry Black was found at his place of business the other morning hard at work upon a design to keep burglars out of his shop, when valuables are lying around loose. On the night of November 10th, his place on State street was invaded by burglars, and the same night a lot of tools were taken from a building at 3632-34 Prairie Avenue, which Mr. Black is plumbing. Harry evidently thinks that the door should be locked after the horse, etc.

D, A. Mundge, of the J. L. Mott Iron Works, is in St. Paul and Minneapolis on business.

The Pike Manufacturing company informs us that they have a plant located at Pell City, Alabama, instead of Waynesborough, Va., as previously reported. The treasurer and general manager, of the Pike Manufacttring Company, is also president of the Pell City Iron and Land Company, having been elected to the latter office on November 4th. Pell City is booming and is destined to beeome a great commercial center in the future.

The L. Wolff Manufacturing Company has just completed its new building on Lake street.

Wm. M. Webster, the accommodating manager of the Plumbing Department, of the J. L. Mott Iron Works, recently returned from an extended business trip throughout the Northwest and reports business very good in that locality. Mr. Webster has secured the contract for the plumbing goods to be put in the new wing addition of the Northern Hospital for the insane at Elgin. This contract calls for forty closets, twelve tubs and twenty washstands. He has also contracted to furnish sixty water closets for the Fountain Springs hotel at Waukesha, Wisconsin.

Martin Moylan has been laid up several days with rheumatism and has not been able to come down to his place of business.

J. R. Alcock, Secretary of the National Association of Master Plumbers, has been missed from the meetings of the Chicago Association, for several weeks passed, during which time the handsome Secretary has been shooting ducks and visiting his father in the Northwest.

Telley & Folsom, of Pittsburg, Pa., will plnmb a house on Atlantic avenue in the Twentieth ward. W. W, Sauer & Brothers of same city will also fit up eight houses on Fox street in the Twenty-fifth ward.

Mr. Molo, a plumber of Duquque, Ia., called at the L. Wolff Manufacturing Company's show rooms this week.

The genial William Bowden reports everything moving along nicely on the South Side at present.

Dan Shehan, of Niles, Michigan, for the first time in three years, spent a few days in the city last week. Dan is getting his share of the plumbing work in Niles, and manages to keep quite busy all the time.

Besides getting the cream of the plumbing trade on the South Side, the energetic firm of Mandable & DeVeney has succeeded in making quite a stake in real estate. They have just closed a deal whereby several thousand dollars will be added to their bank account, and they are negotiating several new deals which promise great returns.

The Dallas *Daily Times-Herald*, in speaking of Robert Griffith's speech at the Texas Master Plumber's banquet, says he made the speech of the evening, and fairly captured the audience. It also refers to Mr. Griffith as a level headed gentleman and a ready talker. What's the mater with the oratory of the Chicago Master Plumbers' Association? It's all right.

Geo. F. Duffey, of Duffey Bros., San Francisco, Cal., made a business trip to Chicago this week. Mr. Duffey says that business is good on the Pacific slope and everything is booming in the West.

The crusade against the smoke nuisance in Chicago moves steadily forward. Chief Inspector Young is in court every day making things uncomfortable for the derelict.

Jno. D. Mouat, of Detroit, Mich., is in the city buying plumbing goods for several large contracts he has on hand. He wishes to establish an agency here for his hot water heater.

The printed proceedings of the Denver Master Plumbers' convention are now ready for distribution.

W. M. Webster of the J. L. Mott Iron Works, severs his concections with the company on Jannary first, 1891, at which time he will associate himself with the Rundle & Spencer Manufacturing Company in the capacity of general manager. The home offices of the company are in Milwaukee, Wisconsin, where two large plants are operated. The Chicago branch office will be located at 193, Lake street. Mr. Webster was employed by the company sixteen years ago as an office boy, but came to Chicago about six years ago where he has since been general manager of the L. Wolff Manufacturing Company, and the J. L. Mott Iron Works of this city. After sixteen years Mr. Webster returns to his former company as one of the partners, which certainly reflects great credit upon his character, ability and integrity. The company will carry a full line of staple goods as well as specialties which Mr. Webster, from his past experience, is so eminently qualified to manage. Mr. Webster's many friends throughout the country, are united in wishing him every success possible, in his new enterprise and undertaking.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Knoxville, Tenn.: A brick business block; cost, $30,000. Disemakes, of Nashville, architect.——Lynn, Mass.: A school building to cost $38,000 will be erected.——Nashville, Tenn.: A five-story building will be erected on North Market street; cost $25,000. George W. Thompson, architect.——Raynor, Tex.: The sum of $40,000 will be expended by the Methodist Society for the erection of a college building.——South Bend, Ind.: A new hotel building is projected; cost, $300,000. Address James and Joseph Oliver for particulars.——Syracuse, N. Y.: A school building will be erected; cost, $28,000.——St. Louis, Mo.: Second and Walnut streets, a brick warehouse; cost, $25,000.——Chicago, Ill.: 353 and 355 W. Harrison street, a four-story stone and apartment building; cost, $55,000. Treat & Foltz, architects. The same architects have planned a six-story addition to the central steam laundry building at Jefferson and Monroe streets. Twenty-first street and Ashland avenue, a three-story basement and attic stone and flat building; cost, $25,000. J. Kralorice & Bro., architects. Vincennes avenue, corner of Boulevard Place, four two-story basement and attic detached residences; cost, $50,000. H. R. Wilson, architect. Park and Wood streets, six-story and basement factory; cost, $30,000. 609-617 Wells street, three-story basement and attic store and flat building; cost, $27,000, H. M. Hansen, architect. Rebecca street, near Douglas Park, eight two-story flat buildings; cost, $60,000. F. Koenig, architect. Fifteenth street, near Douglas Park, nine two-story flats; cost, $60,000. Same architect.——Cincinnati, Ohio: H. E. Siter has made the plans for two school houses for the board of education, and bids are wanted on both at once; No. 1, cost $40,000. No. 2; cost, $70,000.——Ashland, Ky.: Messrs. Crapsey & Brown, architects, of Cincinnati, O., have made plans for an Odd Fellows' building, to cost $25,000. The same firm have sketches under way for a court house at Carlisle, Ky., to cost $25,000. Also, plans are completed for the new harness factory of Graf, Morsbach & Co., to be built in the west end, and to cost, $30,000.——Basic City, Va.: The Norfolk end Western Railroad will erect a depot to cost $25,000.——Huntington, W. Va.: The Ohio River Railroad Company will soon erect a new depot.——Cincinnati, Ohio: The "Big Four" Railroad Company will build a large freight depot on the old union base ball grounds at the foot of Bank street. Engineer Read, of the Central Union depot and railroad company, will have charge of construction. The proposed cost is $150,000.——Churchville, Pa.: This place is to have a new depot.——Southampton, Pa.: A new depot is to be erected.——Brooklyn, N. Y.: St. Marks avenue, near Vanderbuilt avenue, three four-story brick flats; cost, $25,000. Ormzi Hill, architect. Twenty-first street, near Sixth avenue, ten two-story frame dwellings; cost, $20,000. Wm. Wirth, architect. Corner Forty-third street and Fourth avenue, a three-story police station; cost, $34,000. Geo. Ingram, architect. Macon street, near Howard avenue, four two-story brick dwellings; cost, $19,400. Clarence Lincoln, architect. Clinton avenue, near Willoughby avenue, a three-story brick and stone dwelling; cost, $45,000. Wm. B. Tubby, architect.——St. Paul, Minn.: Margaret, near Hope street, a one-story brick church; cost, $32,000. Fifth, near Rosabel street, a five-story brick store; cost, $100,000. Sixth and Minnesota streets, an office building; cost, $40,000. Address Ansel Oppenheim. ——Washington, D. C.: 635 Sixteenth street, a three-story brick building; cost, $25,000. W. B. Gray, architect. ——Wheeling, W. Va.: Plans are being prepared for a church, two hospitals and masonic hall.——Elizabeth, N. J.: A club house is to be erected on Grand street by the Elizabeth Club. Address Mayor Rankin for particulars.——Wilmerding Pa.: The Methodist church people are about to erect a new church.——Boston, Mass.: 465-87 Medford street, a brick bakery; cost, $75,000. Shepley, Rutan & Coolidge, architects. A street, near Richards street, a brick stable; cost, $20,000. M. D. Safford, architect.——Birmingham, Ala.: Sixth avenue and Seventeenth street, a brick school building; cost, $40,000.——Detroit Mich.: Gratiot avenue near Sylvester street, a two and five-story brick brewery; cost, $50,000. Spier & Rohms, architects. Ferry avenue, near Russell street, a three-story brick foundry: cost, $35,000. John Scott & Co., architects. Corner Cass and Prentiss avenues, a three-story brick and stone residence; cost, $35,000. John Scott & Co., architects.——New York City: 1807-9 Park avenue, two five-story brick flats; cost, $40,000. Andrew Spence, architect. Madison avenue, near Eighty-fourth street, a five-story brick and stone flat; cost, $52,000. Jno. H. Duncan, architect. 412-18 Ninety-first street, a ten-story brick factory; cost, $240,000. Alfred Zucker, architect. Ninetieth street, near First avenue, four five-story brick tenements; cost, $56,000. F. Wennemer, architect. Rivington and Lewis streets, a six-story brick store and warehouse; cost, $26,000. Schneider & Herter, architects. 140 Washington street, a brick store; cost, $25,000. C. A. Clifford, architect. 125th street, near Sixth avenue, a five-story brick store building; cost, $40,000. Jno. P. Leo, architect. Cherry and Pelham streets, a six-story brick factory; cost, $26,000. Schneider & Herter, architects. 73rd street, near West End avenue, three four-story brick dwellings; cost, $85,000. C. True, architect. Seventh avenue, near Fifty-third street, a nine-story brick store and storage building; cost,

$450,000. Address the Manhattan Storage and Warehouse Co. Amsterdam avenue and 147th street, a five-story brick flat building; cost, $30,000. H. VanBenschoten, architect. Ninety-eighth street, near Tenth avenue, seven four-story brick dwellings; cost, $200,000. M. V. B. Ferdon, architect.——Pittsburg, Pa.: Two four-story brick stores to be erected on Fifth avenue; cost, $38,000.——New Haven, Conn.: The Harmonic club will erect a club house on Elm street; cost, $20,000.——Germantown, Pa.: The Y. M. C. A. will erect a $50,000 building.——Lancaster, Pa.: Two new school buildings will be erected; cost, $50,000.——Denver, Colo.: Business block, corner Eighteenth and Stout streets; cost, $65,000. A. M. Stuckert, architect. The same architect has plans for a private residence to cost $30,000 and for a Presbyterian church to cost $23,000. Miller & Janisch have plans for a three-story business block to be erected on South Broadway. F. E. Edbrooke & Co. have plans for the following buildings: Hotel oncorner of Seventeenth and Broadway; cost, $1,000,000; a business block on Seventeenth and Curtis; cost, $400,000; a bank building on Sixteenth and Lawrence streets; cost, $275,000; a business block on the corner of Seventeenth and Glenarm streets; cost, $225,000; a club building on Arapahoe street; cost, $125,000; a business block on Seventeenth and Wazee streets; cost, $125,000; a business block on Welton and Seventeenth streets; cost, $60,000; a business block on Stout, near Fifteenth street; cost, $30,000; a block of buildings on Larimer and Twenty-third streets; cost, $20,000; a residence on Colfax and Lafayette; cost $35,000; a residence on Grant avenue; cost, $25,000; building for Central Presbyterian church, corner Seventeenth and Sherman avenue; cost, $150,000; a school building on Logan, near Eighteenth avenue; cost, $40,000; a building for St. Joseph's Home; cost, $35,000; a building for St. Mary's Academy; cost, $200,000; a warehouse on Wazee street, near Sixteenth; cost, $20,000. Kidder & Humphreys have plans for a private residence on Fourteenth avenue; cost, $31,000; for a business block on Lawrence, near Nineteenth street; cost, $30,000; and for the M. E. Church building; cost, $60,000. Varian & Sterner have plans for addition to club house; cost, $40,000; for J. B. Grant's private residence; cost, $50,000; and for several more resident buildings,to cost more than $25,000. Lang & Pugh have plans for the following buildings: R. F. Hunter's private residence; cost, $80,000; a residence for Ralph Voorhees; cost, $25,000; and A. E. Hull's residence; cost, $35,000. Baerresen Brothers have prepared plans for a three-story building to be erected on Twentieth, near California street; cost, $26,000.——Colorado Springs, Colo.: Mr. Long will erect a hotel building to cost $100,000. Architect Sessions is preparing plans for a new block of stores, to be erected on the old site of the Colorado Springs House. The same architect has plans for a large business block on Cascade avenue.

HEATING AND LIGHTING.

Chicago: The Northwestern Electric Motor Company has been organized to manufacture and use electric motors, sell and operate the same; capital stock, $1,000,000; incorporators, Thomas B. Bryan, Frank Weeks and M. W. Towle.——Columbus, O.: One of the largest hot-water contracts of the season has just been secured by the Detroit Heating and Lighting Company for St. Anthony's Hospital of the Sisters of the Poor. There will be about 15,000 feet of radiation, and the new extra large Bolton heaters adapted for large work will be used for the first time.——Lock Haven, Pa.: The Lock Haven Electric Light and Power Company is about to establish a plant. Address J. E. Kelly.——Marion, Pa.: An extensive gas plant is to be established, at a cost of $50,000. Address M. C. Watson for particulars.——La Grange, Ga.: Electric lights will soon be introduced.——Warsaw, N. Y.: The Board of Trustees has granted an electric lighting franchise to George C. Otis and Elmer C. Rowe.——Astoria, Ore.: The Astoria Electric Power Company has been incorporated, with a capital stock of $150,000. Address A. P. Sharpstein for particulars.——Bay City, Mich.: It is proposed to increase the capacity of the electric light plant at an expense of $900. Address the mayor for particulars.——Dayton, Ky.: The city officials have decided to establish an electric light plant at once.——Puyallup, Wash.: Electric lights are to be introduced.——Grapeville, Pa.: An electric light plant is to be erected by the Electric Supply Company.——Santa Fe, N. M.: This place is to introduce a system of electric lights at once. Address the Hon. T. B. Catron for particulars.——Alameda, Cal.: The trustees have decided to invite bids for furnishing a steam fire-engine, and for building the Chestnut street engine-house.——Wheeling, W. Va.: G. W. Atkinson, J. V. L. Rodgers, W. J. W. Cowden and others will organize a stock company to manufacture a household electric light and power plant.——Key West, Fla.: Mr. Philbrick is negotiating with R. Mugge, of Tampa, for the removal of his electric light plant to Key West.——Cordele, Ga.: The National Guaranty Company has purchased the Americus Investment Company's property at Helena for $40,000, and projects the erection of an electric light plant and the construction of water-works.——Fenton, Mich.: The Fenton Electric Light Company has been incorporated.——Seymour, Tex.: A Houston company has made a proposition to erect an electric light plant and an ice factory in Seymour.——Charleston, S. C.: The Charleston Light and Power Company will rebuild its electric light plant.

SEWERAGE NOTES.

Southington, Conn.: It is possible that this town and Litchfield will dispose of their sewerage by irrigation. Representatives of the towns have visited the irrigation farms at Cranston, R. I. and Framingham, Mass., with this object in view.——Newark, N. J.: The Sewer Committee of the Council has decided to report favorably on the construction of a number of sewers.——Columbia, S. C.: D. B. Miller is preparing plans for a sewerage system.——Atlantic City, N. J.: The sewerage company will put in a new 5,000,000 gallon pump.——Knoxville, Tenn.: The cost of the proposed system of sewerage is $240,000. Chairman Gleason, of the Board of Public Works, can furnish information.——Marquette, Mich.: Improvements are to be made to the sewerage system.——Brunswick, Ga.: Several miles of sewers are to be added to the system of this city.——Chico, Cal.: Plans for a sewerage system are now being prepared.——Minneapolis, Minn.: City Engineer Rinker was directed to advertise for proposals for furnishing the city with 2,000,000 sewer brick.——Atlanta, Ga.: Extensions to the sewerage system of this city have been authorized by the Common Council, the cost of which will be $95,000. Address Alderman Hass for particulars.——Grand Rapids, Mich.: Numerous sewer extensions are to be made.——Cordele, Ga.: The city will hold an election to vote on the issuance of $14,000 of bonds to construct a sewerage system.——Denver, Col.: The Board of Public Works has voted $140,900 for sewerage construction in West Denver. The plan of the new works are being gotten up, comprising two district sewers, which when completed will cost $247,000.——Meriden, Conn.: A committee of the common council has reported in favor of taking immediate measures to have a survey made of the city with a view to establishing a system of sewerage. Address Mayor Page.——White Plains, N. Y.: The defective engineering work necessitates the changing of grades and pipes in the sewer system. In a number of places the pipes will have to be taken up and placed at a lower depth. Iron pipe will have to be substituted for vitrified pipes in several places.——Fort Wayne, Ind.: It is proposed to build a sewer in the head of the Shawnee run, in the Southwest end of Fort Wayne. This improvement would cost from $40,000 to $50,000.——Beatrice, Neb.: Beatrice has voted $16,000 for an extension of the storm sewers.——Fall River, Mass., The committee on finance has recommended the authorizing of a sewer loan of $10,000, and a loan of $15,000 to be known as the municipal loan. The sewer loan will be used for the erection of a sewer to connect with the sewer on Holmes street. The municipal loan will be used for the erection of new school houses, repairing of public buildings, and contemplated street improvements.

WATER-WORKS NOTES.

North Knoxville, Tenn.: A committee, with Mayor Gratz as chairman, has been appointed to draw up an ordinance granting a franchise to a company, which proposes to establish a system of water-works.——Lancaster, Pa.: The Water Committee of the common council has recommended that water-meters be used in connection with the water-works service, in order to prevent the excessive waste which prevails at present.——Woonsocket, R. I.: $25,000 will be expended on the extension of the water-works to Manville, a suburb.——Stockton, Cal.: W. S. McMurtry of Los

Gatos, B. D. Murphy of San Jose, John Flournoy of San Francisco, W. S. McMurtry, Jr., of San Francisco, and C. T. Ryland of San Jose, are the directors of the Stockton Water Company. The capital stock is $500,000.——Georgetown, Colo.: A special election was called at Georgetown, Colo., Nov. 12, for the purpose of voting bonds to the extent of $36,000 to construct new or purchase the present water-works at Georgetown.——Uvalde, Tex.: The Uvalde Water-Supply and Power Company has been incorporated; capital, $25,000.——Uniontown, Pa.: The North Union Water Company has been incorporated; capital, $5,000. Directors—W. C. Magee of Pittsburg, C. L. Doyle of Sewickley, Geo. B. Motheras of Allegheny.——Union City, Tenn.: J. E. Beck and others are sinking an artesian well, and state that an electric light plant and an ice factory will be erected and water-works constructed.——Hanover, Mass.: Application has been made to the Secretary of State of Massachusetts, by L. Phillips, M. A. Phillips and others, for a charter for a company to supply water to Hanover and part of Norwell, and to contract with Rockland and Abington for this water-supply.—— Merrimac, Mass.: Prominent citizens have petitioned the Legislature for the incorporation of the Merrimac Water Co., for the purpose of supplying the town with water. The petition is signed by I. B. Little, H. O. Delano and others. ——Ottawa, Ont.: The residents of Rideauville have been granted permission to connect with the city water-works. Address Rev. L. N. Chaupeau for particulars, ——Wheatland, Ia.: An additional water-supply is projected.——Georgetown, Colorado: $36,000 will be expended on the present system of water-works.——Catonsville, Md.: The Catonsville Water Company will issue $30,000 of bonds for improvements.——Mount Tabor, Ore.: The Mount Tabor Water and Light Company has been incorporated. The directors are J. H. Smith, J. C. Moreland and others.——Davenport, Iowa: The Directors of the Davenport Water Company have decided to add to the works a pressure filter plant. The entire work, including the mains, pumps, tanks and other apparatus, will cost in the neighborhood of $200,000.——Sioux City, Ia.: A committee of aldermen, with Superintendent J. F. Sullivan of the water-works, visited Fremont, Neb., recently, to investigate the merits of the Godfrey system. It is probable that the same system will be established in this city.——Scituate, Mass.: The North Scituate people are considering the introduction of a system of water supply. ——Franklin, Ind.: The water-works company has purchased the Jos. Dunlap land, on which its test wells are located, and will at once erect a power house.——West Medway, Mass.: A committee to consider the practicability of putting in water-works at a cost of from $50,000 to $75,000 is to be shortly appointed.——Augusta, Me.: The scheme for a new water supply from the river is being rapidly pushed to completion.——Chicago, Ill.: A company headed by M. M. Towle has been formed to buy the existing water-works of the town of Hammond, Ind., and build a new system to supply Hammond and East Chicago, Hegewisch and Burnham. It is proposed to bring water from Lake Michigan by means of a tunnel from a point about three miles east of the State line.——Leadville, Col.: The surveyors of the United States Geological Survey have been in the city and suburbs for some time. They have selected a site for a storage reservoir in the Upper Arkansas valley, near Eagle Junction. A dam seventy-five feet high will be put up by the Government.——Aspen, Col.: The Midland Water and Power Company has been incorporated; capital stock $50,000; incorporators P. R. Murkin, J. H. Devereux and J. M. Downing.——Madrid, Neb.: The Madrid Water and Improvement Company has been incorporated. The company is organized for the sinking of artesian wells and making such other internal improvements as may be desired. The capital stock is $5,000 and the incorporators are D. D. Dayton, N. T. Potter and others.——Northfield, Vt.: The village has petitioned the legislature for authority to issue bonds to establish a water supply system.——Belvidere, Ill.: The city officials will advertise for bids to put in a water-works system.——La Grange, Ga.: Authority to issue $50,000 of water-works bonds will be asked of the next legislature.——Lexington, Neb.: The opening of proposals for constructing the water-works system has been postponed until November 20.

BIDS AND CONTRACTS.

Bay City, Mich.: Sealed proposals will be received at the office of the Superviisng Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 4th day of December, 1890, for all the labor and material required for the excavation, conerete foundations, stone and brick work of the basement and area walls, first floor iron beams and girders and columns in basement, for the U.S. court-house, post-office and custom-house building, in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Bay City, Michigan. Proposals must be inclosed in envelopes, sealed and marked "Proposal for the Excavation, Concrete Foundations, Stone and Brickwork and Ironwork for the Basement and Area Walls for the U. S. Court-house, Post-Office and Custom-House at Bay City, Michigan, and addressed to Jas. H. Windrim, Supervising Architect.——Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 20th day of November, 1890, for all the labor and materials necessary to complete the approaches, mailing-platform, post-office, lookout, etc., for the U. S. court-house and post-office building at Pittsburg, Pa.——Charleston, S. C.: Proposals are invited for sinking an artesian well. All proposals must be forwarded by the first day of December next. Full particulars will be furnished on application to Zimmerman Davis, Secretary and Treasurer.——Rockford, Ill.: The undersigned will receive proposals for furnishing materials and constructing a sewer, beginning at the south line of Charles street and extending in a southerly direction in Seventn street 2,800 feet, to a point of connection with the Keith's Creek sewer on Eighth avenue. Bids may be filed at the office of the City Clerk on or before Nov. 29, 1890, at 12 o'clock noon. E. K. Conkling, City Clerk.——Toronto, O.: Sealed proposals will be received by the trustees of water-works, at their office in this city, until 12 o'clock noon on Wednesday, Dec. 3, 1890, for furnishing vertical pumping machinery having the capacity to pump 3,000,000 United States gallons of water per 24 hours, from the Ohio River, the source of supply, to the Walker Hill reservoir, some 3,000 feet distant, and with an altitude of approximately 325 feet above the surface of low water in said river. Bids will be received for one or more pumping engines of above capacity to pump 1,500,000 gallons. Also for two return tubular boilers, each 5 feet diameter and 14 feet long, including foundations and the placing the machinery thereon, together with all pipes, valves and fixtures for both steam and water, inside the building. Also including boiler foundations, settings and fixtures complete. General specifications, forms of proposals and forms of contract will be furnished from and after Nov, 14, 1890. O. Y. Crawford, Trustee and Secretary; J. D. Cook, Toledo, O., Consulting Engineer.——Victoria, B. C.: Proposals will be received up to 4 o'clock P. M. on the 17th of December next, at the office of the undersigned, for the construction of sewers for the corporation of the the city of Victoria. Estimated cost of sewers, $300,000. Address Wellington J. Dowler.——Harrison, Ohio: Proposals are wanted until November 24 for the construction of a system of water-works Address Mayor J. A. Graft.——Ballinger, Tex.: Proposals are wanted until January 1, 1891, for the construction of a system of water-works. Address Mayor B. S. Taylor.——Fort Thomas, Ky.: Sealed proposals, in triplicate, will be received at the office of Constructing Quartermaster, U. S. A., Fort Thomas, Ky., until 11 A. M., Nov. 27, 1890, and then opened, for construction there of a hospital and hospital steward's quarters, and for the steam-heating apparatus for the hospital, and for the plumbing of each building. Address R. B. Turner, 6th Infantry A. A. Q. M., U. S. A.——Jersey City, N. J.: Proposals are wanted until December 1, for lighting the public streets for one year from December 1. Address G. P. Robinson, Clerk of the Board of Police Commissioners.——Brownsville, Tex.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 25th day of November, 1890, for all the labor and materials required for the erection and completion of the U. S. court-house, custom-house and post-office building at Brownsville, Tex., in accordance with the drawings and specifications, copies of which may be had on application at this office or at the office of the superintendent at Brownsville, Tex. Address Jas. H. Windrim, Supervising Architect. ——Helena, Ark.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 3d day of December, 1890, for all the labor and materials required for the erection and completion (except heating apparatus and approaches) of the U. S. court-house and post-building, in accordance with the drawings

and specification, copies of which may be had on application at this office or the office of the superintendent at Helena, Arkansas. Address Jas. H. Windrim, Supervising Architect.

UNPROFESSIONAL DESIGNS.

Encroachment upon professional pastures is one of the evils endured by an open and unrestricted profession, like that of the architect. But as what can not be cured must be endured, he does it with as good grace as possible, knowing that his reputation will be sustained by a comparison with the work of those who throw in the designs if given the privilege of erecting the structure.

The architect-builder is, however, a dangerous competitor of the young and inexperienced architect who is striving to gain a fortune, but must face the opposition of those long in the business on the one hand and that of the unprofessional designer on the other, who caters to a certain class of owners, satisfied with most anything as long as it is cheap. The strongest claims put forth by architect-saving builders are that he is a practical man, and from the nature of his business is enabled to build more cheaply by reason of having direct control of materials and labor. The builders' method may be the simpler, and therefore the cheapest; but that does not make it the best. His plan is often an aggravation of the worst points of the purely practical views of the design, and is usually based upon some stereotyped form, or stolen bodily from some one more competent to originate. In the desire to adapt his plan to a certain size lot, he sometimes makes blunders very expensive to the owner. The walls are made thin, space is cribbed from stairs and passages, and rooms are made out of all proportion. The first cost of such a house is perhaps cheaper in actual cash outlay than that built upon the advice of an architect, but the owner in the long run finds it more expensive after he has paid bills for repairs and alterations to bring it up to the required standard. Until the public can be brought to a more thorough realization of the fact that architecture and building are separate and distinct arts, although closely allied, there will be no change for the better, and it will be waste of time for the profession to endeavor to secure legislation in advance of the popular demand for a better stand of architecture in the cheaper class of buildings.—*Exchange.*

THE GLOW WORM'S SECRET.

A recent fascinating research by Prof. Langley impressed upon the scientific world in the most forcible way the imperfection of our present means for obtaining luminous radiation. Mankind congratulated itself when the antiquated candle and oil lamp was replaced by the more convenient and efficient gas. It was filled with joy when gas began to give way to the still more economical and brilliant electric light; and it is something of a rude shock to be told that the pale greenish glow given out by glow worms and fire-flies is considered as a transformation of chemical energy into luminous radiation, four hundred times more efficient than a gas flame and probably almost one hundred times more efficient than an incandescent lamp. These figures, marvelous as they are, are not the result of speculative imagination, but of actual exact measurements. They are not encouraging, except as they teach the immensity of the field that remains to be explored by the inventor. Coming close behind this striking research is another, this time by Staub, a German physicist, who has turned from the methods of nature to those of art, and has been investigating the luminous efficiency of the ghostly glow that comes from a lighted Geissler tube. It need hardly be said that any one at all familiar with vacuum tubes that a considerable degree of efficiency might well be expected, for the heat given out is obviously comparatively small. The final ratio between light and total energy found varied in different tubes and different conditions from 10 to nearly 33 per cent., a prodigious figure compared with that reached by any other method of artificial illumination. The lower limit, to be sure, is scarcely above that found in the incandescent lamp, but the higher ratio speaks for itself. It is possible to about 10 per cent. of the energy bound up in coal as available electric energy. The incandescent lamp gives back as light but one-twentieth of this amount; the vacuum tube then may return nearly one-third, or give a total efficiency of almost 3 per cent., and yet how far behind the glow worm's magic is this, the most efficient artificial process of lighting. It at once teaches a lesson of humility to the too self-satisfied electrician and shows how immensely the resources of mankind may be increased at the hands of whoever shall penetrate the mystery of a single natural process.—*The Electrical World.*

When men's minds are deeply stirred by great calamities, the contributions come quickly enough; but for that higher philanthropy, which comes not from impulse, but from the settled conviction of duty, which rules the lives and governs the actions of men continuously, we do not possess it.—*Times and Register.*

CATARRH.

CATARRHAL DEAFNESS. HAY FEVER. A NEW HOME TREATMENT.

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membranes of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result of this discovery is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks.

N. B.—This treatment is not a snuff or an ointment; both have been discarded by reputable physicians as injurous. A pamphlet explaining this new treatment is sent free on receipt of stamp to pay postage, by A. H. Dixon & Son, 337 and 339 West King street, Toronto, Canada.—*Christian Advocate.*

Sufferers from catarrhal troubles should carefully read the above.

ODD FELLOWS' CONVENTION AT SPRINGFIELD.

On account of the next session of the Grand Lodge, I. O. O. F., to be held at Springfield, Nov. 18-21, the Wabash Railroad will sell tickets to Springfield and return at half rates, November 17, 18 and 19, good returning November 24. Free chair-cars on all trains. Elegant sleepers on night trains. Office, 201 Clark St.

Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

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"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

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For tickets, sleeping car reservations, and all information, apply at the Company's ticket office, 207-209 Clark street, or at its Passenger Station, Madison, Canal and Adams streets.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

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The Whittaker Supply Co., 151 W. Washington street.

SEWER BUILDERS.

Dee, Wm. E., 154 La Salle street.
Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Boyd, T. C., 42 Dearborn street.
Breyer, E., 72 W. Randolph street.
Breyer, C., 833 Milwaukee avenue.
Canty, John, 3105 State street.
Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Klein, Stephen, 712 and 714 Milwaukee avenue.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Probasco, R. P., 36 and 38 Dearborn street.
Reilly, Joseph & Bro., 517 W. Madison street.
Roche, J. H., 208 Thirty first street.
Roughan, M. J., 25 Quincy street.
Ruh, Valentine, 548 Wells street.
Sanders, P. & Son, 505 State street.
Schmidt, Ira T., 145 Michigan street.
Sullivan, John. 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED.—FIRST-CLASS PLUMBERS. None but competent men need apply. No fares paid. W. H. S., 1212 Douglas St., Omaha, Neb.

WANTED.—A FIRST-CLASS GAS FIXTURE man who can also do gas fitting. Address, W. H. Spelman, 1212 Douglas St., Omaha, Nebraska.

WANTED.—A FIRST-CLASS BRASS FINisher, one able to handle men, to take charge of our brass finishing department. Ette & Henger Mfg. Co., St. Louis, Mo.

WANTED.—SUPERINTENDENT FOR CHIcago Branch by manufacturers of a specialty in the Plumbers' line. Applicant must have had several years' experience among Chicago Plumbers, Builders and Architects. Thoroughly acquainted with credits, and come highly recommended for integrity, push and executive ability. Good pay to the right man. Address, "G. W. B.," care of THE SANITARY NEWS.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A THOROUGHLY competent heating engineer. Can do anything from soliciting to practically doing work. Location no object. Address, "H. E.," THE SANITARY NEWS.

SITUATION WANTED.—BY A YOUNG MAN, 20 years of age, as salesman for a wholesale plumbing house, or to sell some specialty in the plumbing line. Has had four years experience with plumbing goods. Address "Sales," care THE SANITARY NEWS.

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SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 29th day of November, 1890, for all the labor and materials, and fixing in place complete, the low-pressure, steam heating and ventilating apparatus for the United States Post Office, etc., building at Houston, Texas, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Houston, Texas. Each bid must be accompanied by a certified check for $100.00, The Department will reject all bids received after the time herein stated for opening the same; also all bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in an envelope sealed and marked "Proposal for the Low-Pressure, Steam Heating and Ventilating Apparatus, for the United States Post Office, etc., Building at HOUSTON, TEXAS," and addressed to
JAS. H. WINDRIM,
November 10th, 1890. Supervising Architect.

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Up to the time of the issue of the *St. Nicholas Magazine*, seventeen years ago, literature and children's magazines were almost contradictory terms, but the new periodical started out with the idea that nothing was too good for children; the result has been a juvenile magazine genuine with conscientious purpose,—the greatest writers contributing to it. with the best artists and engravers helping to beautify it,—and everything tuned to the key-note of youth.

It has been the special aim of *St. Nicholas* to supplant unhealthy literature with stories of a living and healthful interest. It will not do to take fascinating bad literature out of boys' hands, and give them in its place Mrs. Barbauld and Peter Parley, or the work of writers who think that any "good-y" talk will do for children, but they must have strong, interesting reading, with the blood and sinew of real life in it—reading that will waken them to a closer observation of the best things about them.

In the seventeen years of its life, *St. Nicholas* has not only elevated the children, but it has also elevated the tone of contemporary children's literature as well. Many of its stories, like Mrs. Burnett's "Little Lord Fauntleroy," have become classic. It is not too much to say that almost every notable young people's story now produced in America first seeks the light in the pages of that magazine.

The year 1891 will prove once more that "no household where there are children is complete without *St. Nicholas*." J. T. Trowbridge, Noah Brooks, Charles Dudley Warner and many well-known writers are to contribute during this coming year. One cannot put the spirit of *St. Nicholas* into a prospectus, but the publishers are glad to send a full announcement of the features for 1891 and a single sample copy to the address of any person mentioning this notice. The magazine costs $3.00 a year. Address The Century Co., 33 East 17th St., New York.

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A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E AND **G.** **Y** BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

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G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

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P. WATER-CLOSET TEES, with righthand bath inlet.

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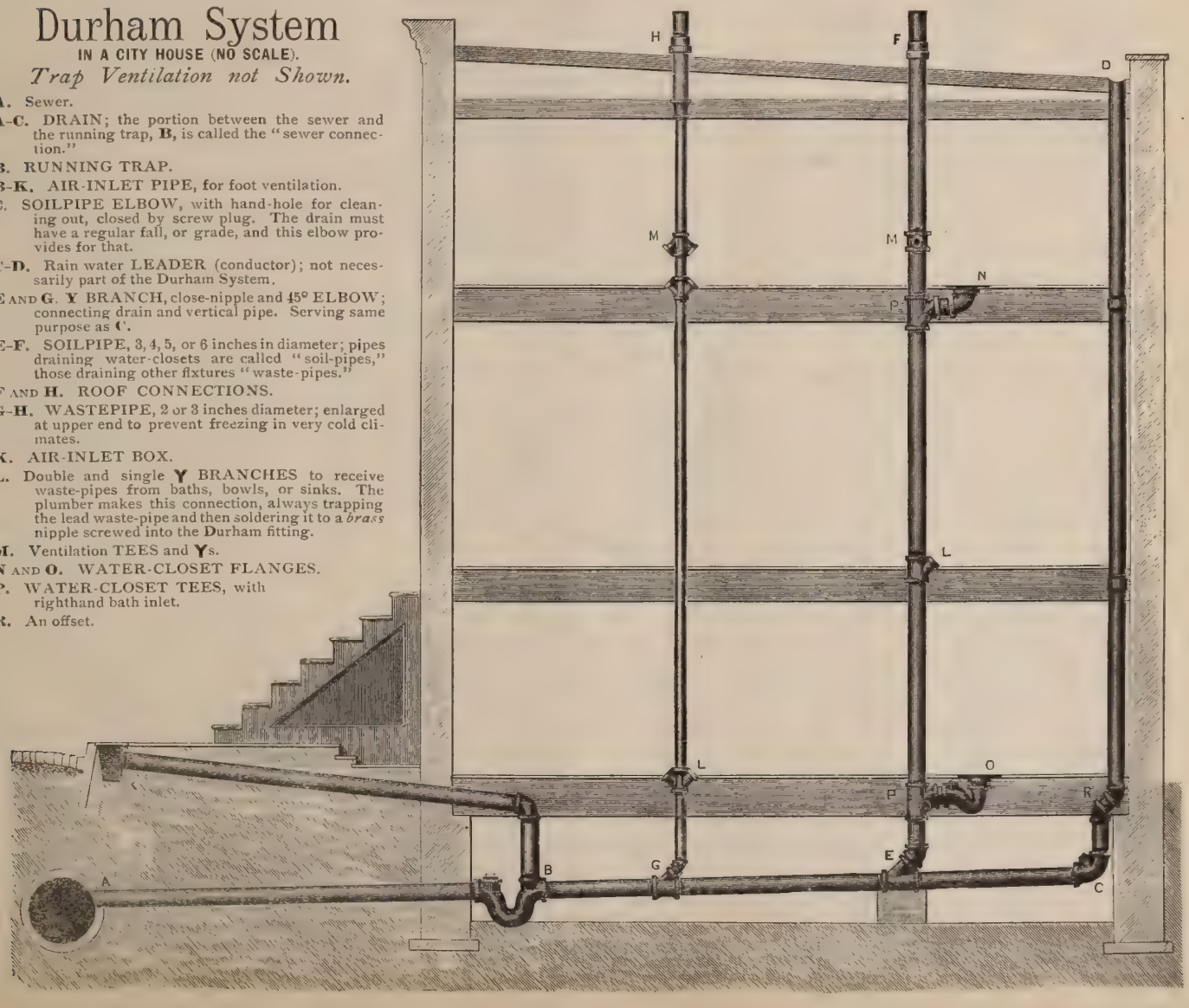

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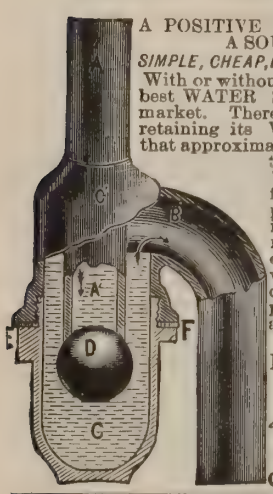

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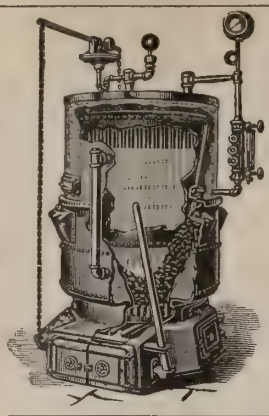

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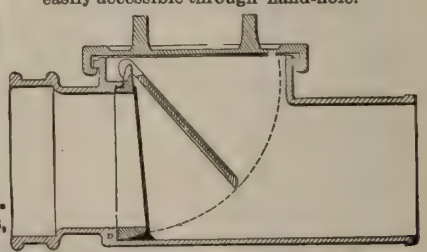

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Send for circulars and see testimony of prominent persons cured.

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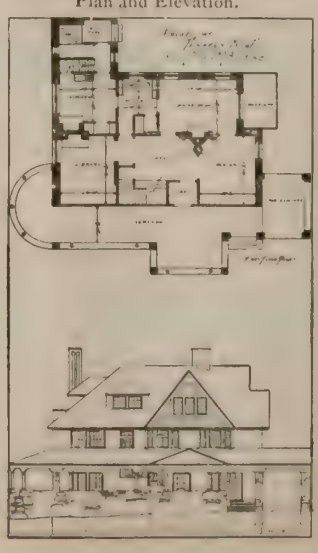

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Thomas Hudson, - - - - - - - - - Publisher.
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Henry R. Allen, - - - - - - - - London Agent.

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SUBSCRIPTION RATES.

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The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to The Sanitary News.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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In regard to the office of state boards of health, Dr. Henry B. Baker, the efficient Secretary of the Michigan State Board of Health, says: "The State Board of Health is a grand power for the advancement of human knowledge for the noblest of all purposes, the betterment of the physical, mental and moral condition of all mankind. I believe that knowledge is power. How shall we best get the most of it? How shall we best impart it to our brothers who need it? There is in the minds of some people an idea that State Boards of Health should be mainly great and powerful for the abating of some nuisance, dealing with nuisances large or small, but nuisances which no local Board of Health has abated; nuisances also which no local Board can abate; that the State Board should have mandatory powers to compel obedience to his own views of public sanitation, to its own interpretation of public health laws, many of which laws are enacted because of, and are based upon results of, investigations made by State Boards of Health. I do not think this desirable. I believe in local self-government. If the State Board has to do the work of the local Boards it cannot do much that it should do, and which cannot be done by the local Boards. I believe we should teach the localities to take care of themselves." The importance of this utterance lies in the fact that this is the course pursued by the State Board of Health of Michigan, and Michigan is one of the best equipped and governed states in this direction in the union.

One important thing for people to learn is that there is good and bad plumbing; another is the importance of procuring the best.

When in doubt about the condition of your plumbing, do not give the plumbing the benefit of the doubt, but go and get a reliable plumber to inspect it and clear up the doubt—if need be by repairs.

It is a fact worth noticing that about all the papers read before the Chicago Master Plumbers' Association during this year have been republished in our English contemporaries.

In this issue will be found Prof. Koch's method of curing, or rather preventing, consumption. The tone of his speech indicates a hopefulness and faith which are more assuring from the fact that the entire article is pervaded with the spirit of conservatism and caution. The modesty and reserve, the plain statement of his experience, and the bounds set to his remedy, impress the reader with the truth of the Professor's great discovery. There is evidence in the facts thus far published, that, if Prof. Koch has not found the remedy for which he has searched, he is investigating in the right direction and will succeed. It is too early to claim all that is hoped for, yet it can be claimed that humanity is on the eve of receiving the greatest blessing science has ever bestowed—protection against mankind's greatest and most deadly foe.

DISSEMINATION OF SANITARY KNOWLEDGE.

The value of knowledge lies in its practical utilization. The value of any public good is greatest when distributed to the greatest number. To make sanitary knowledge available and productive of the greatest good, it must be generally disseminated throughout the country. The greatest obstacle in the way of health-boards and other public health agencies, is ignorance. People do not comprehend the importance of hygienic laws, and, through ignorance of these, fail to appreciate or regard the efforts of health officers. Orders or recommendations from health-boards are disregarded because the people cannot comprehend their importance, and do not understand the ends to be attained. Sanitary science is comparatively new, and the prevention of disease as an actuality has not been impressed upon the public mind. There is a vast difference in the popular comprehension between the curing of disease and its prevention. The one is an actual, visible, comprehensible presence; the other is vague, intangible and not discernable by any of the senses. Man knows when he is sick, but he is unconscious of approaching disease because he is ignorant of the conditions that produce his maladies. He finds a remedy for disease in the physician, but he seeks no remedy for threatened sickness, because he is not conscious of the approach of any ills. The question is, how shall the people be taught the importance of preventive medicine to the same extent as that of therapeutics?

It is not possible to make of every person a doctor or a sanitary expert. Such is not demanded. But it is possible to disseminate sanitary knowledge to such an extent that the people will ascribe as much importance to the prevention of disease as they now do to its cure. An advance will be marked if the people can be taught that there is such a thing as the prevention of disease. If it were impossible to teach them the laws of hygiene and the practical application of the principles of sanitation, great progress would be made could they but be taught that, through obedience to certain rules and regulations, disease could be arrested. It is surely possible to extend knowledge this far,

and it is not at all impossible to extend it far enough to enable the people to understand the underlying, which are the simpler principles of preventive medicine, and make a practical application of them. The problem lies in getting this information to the public.

We are told that our public schools furnish this information. We know that some states require "hygiene" taught in its schools, but what is it that is taught? Anatomy, physiology and a certain kind of hygiene. The text books placed in our schools are not of the character to teach sanitary science as it is understood and practiced to-day. The pupil may learn to number the bones in the human body and to name them, but is ignorant of the value of simple cleanliness. Besides this, such as is taught is taught to children too young to comprehend it or even think of applying it. It is true that the children of to-day become the heads of families in the future, but how much of this knowledge will they carry with them and how much will they apply? It is not the children, but the heads of families, that should be reached. The teaching of this subject in the schools is to be highly commended, but it is the home that must be awakened and inspired with the gospel of health. The home is the center of life that subdues the earth, and into it should pour the stream of knowledge, refreshing and health-giving as that of the smitten rock. Make healthy and happy homes and the great object of sanitation will have been attained. These are the centers into which should be directed the knowledge gathered from the fields of research and the laboratories of experiments and investigation.

Before us are two monthly bulletins, one issued by the Iowa State Board of Health, the other by that of North Carolina. Other states issue like publications. One of these contains an article on diphtheria simple enough to be understood by all who can read, and the other has an article on the use of water. Both contain information of direct and practical value to the people. We do not know how extensive the circulation of these publications is, or to what class they are sent, but they ought to go to every family in their respective states. By this means, each month, an important lesson could be given to the people—seed sown that would return an hundred fold.

The issue of The Sanitary News of October 25, contained a report of the quarterly meeting of the Tennessee State Board of Health. In it were many things of interest and importance to the general reader. This was sent us by the Secretary of the Board, Dr. J. Berrin Lindsley. It was sent us in the form of proof slips from the article as put in type for the monthly Bulletin. This suggests the idea of a very inexpensive method of giving such information a very extensive circulation. If the state boards would prepare an extract of the proceedings at their different meetings and send it to the press of the state, it would be very generally published, for newspapers cannot afford, nor do they have a desire, to refuse the publication of matter of such interest and value to their constituents. We see that several of our exchanges have made extracts from the report of Dr. Lindsley published in this journal, and so the information spreads. If the right kind of information is prepared, the press will gladly accept it. It does not want set forms of statistics, neither do the people; but matter containing useful information—something that will be of benefit to the reader—will be welcome. The press could be used by health officers to a much greater extent than it now is and with mutual benefit.

NOTES AND NEWS.

The bad quality of the potatoes at Killarney has produced an outbreak of fever.

The prevalence of diphtheria at San Francisco, Cal., is ascribed to the neglect to flush the city's sewers.

The completion of the St. Clair Tunnel has revived the project of a tunnel across the Straits of Northumberland to Prince Edward Island.

The American Academy of Medicine will hold its next annual meeting at Philadelphia, Wednesday and Thursday, December 3 and 4, 1890.

Dr. Clarence Thwing, of Brooklyn, has accepted an invitation to establish one or more missionary hospitals in the Territory of Alaska, beginning at Sitka.

By a new device, pieces of metal may be shaped with great rapidity by being forced under dies while rendered soft or plastic by an electric current.

The plan of using gas in small electric arcs to increase their power at a less expense than that of extra current has been effectively carried out by means of hollow carbons. An added cost of 6 per cent. is said to give in this way a light equal to one and one-half times that of the ordinary lamp.

It has been suggested that the study of the influence of diet and habit upon the color of hair in different nations of men may cause discoveries by which the color of the hair in the human race may be modified by judicious treatment.

Russia now allows female physicians to practice in all parts of that empire. They will wear a badge of their profession, and can practice in female schools and institutions admitting women, in similar institutions of the Zerustvos, aud are specially exempted from calls as experts to attend criminal trials.

The *Alabama Age* states that the law regulating registration in that state was so curiously worded that, though the Supreme Court has decided that illegal practitioners are criminals, they cannot be punished. An effort is being made to remedy this omission, but is opposed by the practitioners who do not belong to the regular school.

Dr. Broadbent, in an address before the British Medical Association, says a mark of a weak medical man "is the indiscriminate use of stimulants in fevers, a ready resort to narcotics and sedatives, treatment directed to symptoms only, and a fondness for new drugs of high sounding names."

According to *L' Electricite*, Santa Cruz, a city of 16,000 inhabitants, and the capital of the Canary Islands, has a soil of such extreme hardness that trenches and street excavation for gas works have been impracticable, and present negotiations for an electric light service make special allowance for the post holes, and reduce their number as much as possible.

An invention which is designed to supplant nature is a substitute for white pine. The rapid disappearance of the white pine is a solid fact, and it will not be many years before such an invention will have a practical value, The substitute for timber, as indicated, will be found in smaller trees, reduced to pulp and pressed in molds into the sizes and shapes wanted.

The *British Medical Journal* states that Dr. Fontain, a Russian observer, has recently demonstrated the existence in hailstones of pernicious microbes or microscopic organisms. The water resulting from the melting of the stones used in the experiments yielded an average of 729 bacteria to the cubic centimeter (a volume about the size of a small marble). Nine different forms of bacteria were discovered, including the bacillus mycoides.

At the annual meeting of the Tri-State Medical Association the following were elected as officers for 1891: President, Dr. Robert Battey, Rome, Ga.; First Vice-President, Dr. E. T. Camp, Gadsden, Ala.; Second Vice-President, Dr. Richard Douglas, Nashville, Tenn.; Third Vice-President, Dr. D. H. Howell, Atlanta, Ga.; Secretary, Dr. Frank Trester Smith, Chattanooga, Tenn.: Treasurer, Dr. B. S. Wert, Chattanooga, Tenn. On motion the Association adjourned to meet in Chattanooga, Tenn. (date to be decided on), 1891.

The *Indian Engineer* says that, omitting lakes, which are in many cases natural reservoirs, the largest reservoir or artificial lake in the world is the great tank of Dhebar, 20 miles southeast of Udaipur, Rajputana, which covers an area of 21 square miles. The masonry dam is 1,000 feet long by 95 feet high; 50 feet wide at the base and 15 at the top. In Southern India also, there are some immense reservoirs. That of Cumbum, is formed by damming the Gundlakamana River by a dam 75 feet high, thrown between two hills. This reservoir has an area of 15 square miles. The Sulekere Reservoir in Mysore is a very little smaller, and, next to Cumbum, is the finest in Southern India.

The dust and mortar on old tear-out jobs, collects in the plumbers' hair, making it matty, thick and harsh. If the white of an egg is rubbed in the hair occasionally, and then washed out with clean water, all the dirt will be removed. Borax and water are also good for the purpose, or take equal parts of borax, bay

rum and ammonia, which make a nice preparation for cleansing the head. Apply freely to the scalp with a brush, and then wash in clean water.—*American Plumber.*

The utilization of running streams is the object of many recent devices, among which may be mentioned that of M. Tayn, a Russian engineer. His apparatus consists of an endless cable, carrying a series of canvas cones, which open and shut like an umbrella. The cable passes over a double drum on board a pontoon, and at the other end over a pulley suspended from a buoy. On the lower part of the rope the cones are opened and forced forward by the current of water, thus setting in motion a shaft or drum.

The eighteenth annual meeting of the American Public Health Association will be held at Charleston, S. C., December 16, 17, 18 and 19, 1890. The President is Dr. Henry B. Baker, of Michigan; Dr. Joseph H. Raymond, of Brooklyn, N. Y., is Secretary; Dr. H. B. Hoelbeck is Chairman of the Committee of Arrangements. The subjects selected for consideration at that meeting will be as follows: "House Architecture;" "Heating, Lighting, Drainage and Ventilation;" "Sewage Disposal;" "Marine Sanitation;" "Control of Tuberculosis;" "Isolation Hospitals;" "Establishments in favorable Climates for persons predisposed to Tuberculosis;" "Schools for Children;" "Sanatoria;" "Permanent Residences," etc.

The Trades Union Congress is not a likely place foe the ventilation of sanitary matters, but during that just held, several matters of hygienic importance have been brought forward. With regard to insanitary factories, it was pointed out that the number of inspectors is insufficient. "Sweating" was a sanitary, as well as an economic, evil, for clothes were made under conditions calculated to spread disease, *i. e.*, in workshops where the workers had only from one hundred and twenty to one hundred and eighty cubic feet of space each, whereas convicts in prison had from four hundred to five hundred cubic feet. It was a mistake to imagine that only very cheap clothes were made in sweating dens; garments ordered for the Royal Family had been traced to the East End. A strong opinion was expressed at the Congress in favor of extending the provisions of the Factory and Workshop Act to domestic workshops; the laundresses' delegate wished all places where washing was done to be included. A resolution was also unanimously passed at the Congress in favor of the compulsory registration and examination of plumbers.

The circular issued by John S. Billings, M. D., directs attention to the fact that the Seventh International Congress of Hygiene and Demography will be held in London during the week beginning August 10, 1891. The governments of all countries and municipalities, and all public health authorities, universities, colleges and societies occupied in the study of sciences more or less immediately connected with hygiene, are invited to co-operate and appoint delegates to represent them at the Congress. The Prince of Wales will preside. A committee of Organization has been formed, of which Sir Douglas Galton is Chairman, and Prof. W. H. Corfield and Mr. Shirley F. Murphy are Honorary Secretaries. An exhibition of articles of hygienic interest will be held in connection with the congress. The last of these congresses was held in Vienna, in 1887, and was attended by over 2,000 persons, and it is expected that the London meeting wlil be one of great magnitude and im-portance.

A few days ago I was standing by an American gentleman, when I expressed a wish to know which point was north. He at once pulled out his watch, looked at it, and pointed to the north. I asked him whether he had a compass attached to his watch. "All watches," he replied, "are compasses." Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half-way between the hour and the figure XII. on the watch. For instance, suppose that it is four o'clock. Point the hand indicating four to the sun, and II. on the watch is exactly south. Suppose that it is eight o'clock, point the hand indicating eight to the sun, and the figure X. on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing everyone else knew, and happening to meet Mr. Stanley, I asked that eminent traveller whether he was aware of this simple mode of discovering the points of the compass? He said that he never heard of it. I presume, therefore, that the world is in the same state of ignorance. Amalfi is proud of having been the inventor of the compass. I do not know what town boasts of my American friend as a citizen.—*Truth*, London.

THE SMOKE NUISANCE.

Once again the question of smoke abatement is occupying the attention of the authorities of the large manufacturing towns, notably Glasgow, Leeds, and Manchester in this country, and Chicago and Cleveland in the United States, says the London *Mechanical World.* As to the methods by which this nuisance is to be reduced, engineering experts differ very considerably among themselves. Many are emphatic in their preference for some particular form of mechanical stoker, while others assert that a certain firebar is all that is required; others, again, pin their faith to arrangements for admitting air to steam over or under the grate or behind the bridge. It is, however, generally admitted (except by those specially interested in some particular device), that there is no universal panacea for the prevention of smoke, and that a system which in one case will deal very successfully with the trouble will, under even slightly different conditions, prove a disastrous failure. Knowing this, the small manufacturer may well hesitate before allowing makers of mechanical stokers to experiment (at his expense) with a view to reduce the emission of smoke. Not only is the first cost of most mechanical stokers very considerable, but the wear and tear must, under the prevailing conditions, necessarily be very great, and again there is the question of driving power to be considered. Moreover, it cannot always be said that they are effectual as smoke preventers. In not a few instances the great economy which appears to have followed upon their application will be found to be due to the bad hand-firing which they displaced, rather than to any particular virtue of their own; and here it may be noted that manufacturers who adopt mechanical stokers to lessen hand labor are generally those who would employ unskilled laborers in the capacity of stokers from motives of economy (?). Steam users do not appear to realize the fact that in a great many cases an efficient stoker is the best and most economical smoke preventer. It is not easy to see why this should be so, considering that the experiment is not a costly one to try, the greatest difficulty being to obtain suitable men. Many manufacturers, who very rightly insist upon their engines being periodically indicated, appear disposed to forget that the real cost of power depends upon the amount of coal used. The economy is too often all in the engine room; the boiler house being in a measure left to take care of itself. An insufficient supply of air to a furnace is a common cause of smoke-making, and many a bad furnace may be improved by increasing the supply of oxygen. Indeed, it is possible that this is the real cause of the improvement apparently due to the use of steam jets, the effect being brought about simply by the increased draught induced by the action of the jet, and not by any action of the steam, *per se* as is frequently assumed. Boiler furnaces which are worked under conditions that convert them into retorts, may well be expected to make smoke, and so long as steam users are content to ignore the principles upon which combustion depends, the smoke nuisance in our large manufacturing towns will continue to grow, until at last the ever increasing price of fuel will compel attention to be given to the matter. On the other side of the Atlantic they do not regard the matter in the apathetic manner which has become general in this country. They are not content to complain and bear it, but in several of the large towns—Chicago, for example—strenuous efforts are being made to abate what threatened to become an intolerable nuisance. The authorities of that city no longer accept the excuses from offenders, that they have tried numbers of smoke-preventing appliances without success. This policy has already had a beneficial effect, in as much as the Chief Inspector reports that between March 30 and September 1 of this year, 1,825 chimneys have been made to virtually stop smoking. Nor are locomotives entering the city allowed to pour forth volumes of smoke, as in this country. On all but one railway entering the city smoke-consuming appliances have been fitted to all the locomotives. It is said that the atmospheric condition of the city has already improved considerably, and no doubt, if the truth were known, the former offenders have realized, to some

extent, the benefits of this system of "compulsory thrift." With praiseworthy zeal, smoke-abatement societies have been formed in various parts of this country, but the ultimate object of these associations does not appear to be more than to report upon various appliances submitted to their notice, and has thus little or no direct bearing upon the question at issue. If a steam user or manufacturer is seized with the laudable desire of preventing the emission of smoke from his chimney, the first agent for a mechanical stoker or smoke-preventing appliance he calls in, is naturally confident that the device in which he is interested is the most suitable in the market for the particular conditions under which the fires are worked. Occasionally this may be the case, but in nine cases out of ten it is not so. The boiler owner, however, is not sufficiently competent to dispute the point, and the appliance is fitted on to the boilers, often at a large cost, and frequently without effecting the purpose intended. Smoke-abatement societies should provide qualified experts who, by inspecting the conditions under which the furnaces are worked, would be in a position to advise the owner as to the best course to pursue in each case. This would at least avoid unnecessary expense, and in many cases the steam user would be agreeably surprised to find that the solution of the problem resolved itself into a slight alteration of the furnace, or in the method of stoking, while if some type of mechanical stoker appeared likely to meet the requirements of the case, those which the society has tested and consider suitable might be recommended, leaving the boiler owner to decide as to the particular make to be adopted. In the face of the fact that public opinion may some day compel the strict enforcement of the law, manufacturers wovld do well to face the matter, and at the same time practice economy in the use of their fuel.

KOCH'S CURE FOR CONSUMPTION.

The *Medical News* of the 15th inst. contained the following special cable from Berlin, containing the translation of Prof. Koch's paper in the *Deutsche Medicinische Wochinschrift*:

In an address delivered before the International Medical Congress I mentioned a remedy which conferred on the animals experimented upon an immunity against inoculation with the tubercal bacillus and which arrested tuberculous disease. Investigations have now been carried out on human patients, and these form the subject of the observations to follow. It was originally my intention to complete the research, and especially to gain sufficient experience regarding the application of the remedy in practice and its production on a large scale before publishing anything on the subject; but in spite of all precautions so many accounts have reached the public, and in such an exaggerated and distorted form, that it seems imperative, in order to prevent all false impressions, to give at once a review of the position of the subject at the present stage of the inquiry. It is true that this review must, under these circumstances, be brief, and must leave open many important questions.

The investigations have been carried on under my direction by Drs. Libbertz, Stabsarzt and Pfuhl, and are still in progress. Patients were placed at my disposal by Prof. Brieger, from his polyclinic; Dr. W. Levy from his private surgical clinic; Drs. Frantzel, Oberstabsarzt, and Kohler from the charity hospital, and Bergman from the surgical clinic of the University. I wish to express my thanks to these gentlemen. As regards the origin and the preparation of the remedy I am unable to make any statement, as my research is not yet concluded. I reserve this for a future communication. Doctors wishing to make investigations with the remedy at present can obtain it from Dr. A. Libbertz, Lueneburger strasse, 28, Berlin, N. W., who has undertaken the preparation of the remedy with my own and Dr. Pfuhl's cooperation, but I must remark that the quantity prepared at present is but small, and that larger quantities will not be obtainable for some weeks.

THE NEW LIQUID.

The remedy is a brownish, transparent liquid, which does not require special care to prevent decomposition. For use this fluid must be more or less diluted, and the dilutions are liable to undergo decomposition if prepared with distilled water. As bacterial growths soon develop in them they become turbid, and are then unfit for use. To prevent this the selected liquid must be sterilized by heat and preserved under a cotton wool stopper, or, more conveniently, prepared with a ½ per cent solution of phenal. It would seem, however, that the effect is weakened both by frequent heating and by mixture with phenal solution, and I have therefore always made use of freshly-prepared solution. Introduced into the stomach the remedy has no effect. In order to obtain a reliable effect it must be injected subcutaneously, and for this purpose we have used exclusively the small syringe suggested by me for bacteriological work. It is furnished with a small India rubber ball and has no friction. This syringe can easily be kept antiseptic by the use of alcohol, and to this we attribute the fact that not a single abscess has been observed in the course of more than a thousand subcutaneous injections. The place chosen for the injection, after several trials of other places, was the skin of the back between the shoulder-blades and the lumbar region, because here the injection led to the least local reaction, generally none at all, and was almost painless. As regards the effect of the remedy on the human patient it was also clear from the beginning of the research that in one important particular the human being reacts to the remedy differently from the animal generally used in experiments—the guinea pig—a new process for the experimenter of the all-important law that experiment on animals is not conclusive. The human patient proved extraordinarly more sensitive than the guinea pig. As regards the effect of the remedy, a healthy guinea pig will bear a subcutaneous injection of two cubic centimeters, and even more, of the liquid without being sensibly affected, but in the case of a full-grown, healthy man 0.25 cubic centimeter suffice to produce an intense effect. Calculated by the body weight one-fifteenth thousandth part of the quantity which has no appreciable effect on the guinea pig acts powerfully on the human being.

HOW IT ACTS.

The symptoms arising from an injection of 0.25 cubic centimeter I have observed after an injection made in my own upper arm. They were briefly as follows: Three to four hours after the injection there came on pain in the limbs, fatigue, inclination to cough, difficulty of breathing, which speedily increased in the fifth hour and were unusually violent. A chill followed, which lasted almost an hour. At the same time there was nausea, vomiting, and rise of body temperature to 39.6 deg. After twelve hours all the symptoms abated, the temperature fell, and the next day it was normal. A feeling of fatigue and pain in the limbs continued for a few days, and for exactly the same period of time the site of injection remained slightly painful and red. The smallest quantity of remedy which will effect the healthy human being is about .01 cubic centimeter, equal to one cubic centimeter of the one-hundreth dilution. As has been proved by numerous experiments, when this dose is used reaction in most people shows itself only by slight pains in the limbs and fatigue. A few showed a rise of temperature to about 38 deg. C.

Although the effect of the remedy in equal doses is different in animals and human beings if calculated by body weight, in some other qualities there is much similarity in the symptoms produced, the most important of these resemblances being the specific action of the remedy on the tuberculous process, the varieties of which I will not here describe. I will make no future references to its effect on animals, but I will at once turn to its extraordinary action on tuberculosis in human beings.

IN CASES OF TUBERCULOSIS.

The healthy human being reacts either not at all, or scarcely, we have seen, when .01 cubic centimeter is used. The same holds good with regard to patients suffering from diseases other than tuberculosis, as repeated experiments have proved; but the case is different when the disease is tuberculosis. A dose of .01 cubic centimeter injected subcutaneously into the tuberculous patient caused a severe general reaction as well as a local one I gave children aged from 2 to 6 years one-tenth of this dose—that is to say, .001 cubic centimeter, and delicate children only .0005 cubic centimeter—and obtained powerful but in no way dangerous reaction. The general reaction consists in an attack of fever, which usually begins with rigors, and raises the temperature above 39 deg., often up to 40 deg., and even 41 deg. C. This is accompanied by pain in the limbs, coughing, great fatigue, and often sickness and vomiting. In several cases a slight icteroid discoloration was observed, and occasionally an eruption

like measles on the chest and neck. The attack usually begins four or five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later and then runs its course with less intensity. The patients are little affected by the attack, and as soon as it is over feel comparatively well, generally better than before. The local reaction can be best observed in cases in which the tuberculous affection is visible. For instance, in cases of lupus changes take place which show the specific anti-tuberculous action of the remedy to a most surprising degree. A few hours after an injection into the skin of the back—that is, in a spot far removed from the diseased area on the face or elsewhere—the lupus begins to swell and to redden, and this it does generally before the initial rigor. During the fever the swelling and redness increase and may finally reach a high degree, so that the lupus tissue becomes brownish and necrotic in places where the growth was sharply defined. We sometimes found a much swollen and brownish spot surrounded by a whitish edge almost one centimeter wide, which again was surrounded by a broad band of bright red. After the subsidence of the fever the swelling of the lupus tissue gradually decreases and disappears in about two or three days. The lupus spots themselves are then covered by a soft deposit, which filters outward and dries in the air. The growth then changes to a crust, which falls off after two or three weeks and which sometimes after only one injection leaves a clean red, cicatrix behind. Generally, however, several injections are required for the complete removal of the lupus tissue. But of this more later on.

I must mention as a point of special importance that the changes described are confined to the parts of the skin affected with lupus, even the smallest nodules, and those most deeply hidden in the lupus tissue go through the process and become visible in consequence of the swelling and change of color, whilst the tissue itself in which the lupus changes have entirely ceased, remains unchanged.

SHOULD START WITH A LUPUS CASE.

The observation of a lupus case treated by the remedy is so instructive and is necessarily so convincing that those who wish to make a trial of the remedy should, if possible, begin with a case of lupus. This specific action of the remedy in these cases is less striking, but is as perceptible to eye and touch as are the local reactions in cases of tuberculosis of the glands, bones, joints, etc. In these cases swelling, increased sensibility, and redness of the superficial parts are observed. The reaction of the internal organs, especially of the lungs, is not at once apparent unless the increased cough and expectoration of consumptive patients after the first injection be considered as pointing to a local reaction in these cases. The general reaction is dominant; nevertheless we are justified in assuming that here, too, changes take place similar to those seen in lupus cases.

The symptoms of reaction above described occurred, without exception, in all cases in which tuberculous process was present in the organism after a dose of .01 cubic centimetres, and I think I am justified in saying that the remedy will, therefore, in the future, form an indispensable aid to diagnosis. By its aid we shall be able to diagnose doubtful cases of phthisis. For instance, in a case in which it is impossible to obtain to a certainty the nature of the disease by the discovery of bacilli or elastic fiber in the sputum or by physical examination, affections of the glands, latent tuberculosis of the bone, doubtful cases of tuberculosis of the skin, and similar cases, will be easily and with certainty recognized. In cases of tuberculosis of the lungs, of joints which have been apparently cured, we shall be able to make sure whether the disease has really finished its course and whether there be still some diseased spots from which it might again arise, as from a spark hidden by ashes.

Of greater importance, however, than its diagnostic use is the therapeutic effect of the remedy. In the description of the changes which a subcutaneous injection of the remedy produces in portions of the skin affected by lupus I mentioned that after the subsidence of the swelling and decrease of the redness the lupus tissue does not return to its original condition but that it is destroyed to a greater or less extent and disappears. Observations shows that some of this result is brought about by the diseased tissue becoming necrotic, even after but one sufficiently large injection, and at a later stage it is thrown off as a dead mass. In other parts a disappearance or, as it were, a necrosis of the tissue seems to occur, and in such cases the injection must be repeated to complete the cure.

THINGS TO BE DISCOVERED.

In what way this process of cure occurs cannot as yet be stated with certainty, as the necessary histological investigations are not completed, but this much is certain, that there is no question of a destruction of tubercule bacilli in the tissues. Only the tissue inclosing the tubercule bacilli is affected by the remedy. Beyond this there is, as is shown by the visible swelling and redness, considerable disturbance of the circulation, and, evidently, in connection therewith deeply-seated changes in nutrition which cause the tissue to die more or less quickly and deeply, according to the extent of the action of the remedy. To recapitulate, the remedy does not kill the tubercle bacilli but the tuberculous tissue, and this gives us clearly and definitely the limit that bounds the action of the remedy. It can influence living tuberculous tissue only, and has no effect upon dead tissue, as, for instance, necrotic cheesy masses, necrotic bones, etc.; nor has it any effect upon tissue made necrotic by the remedy itself. In such masses of dead tissue living tubercule bacilli may possibly still be present, and are either thrown off with the necrosed tissue or may possibly enter the neighboring and still living tissue under certain circumstances of the therapeutic activity.

If the remedy is to be rendered as fruitful as possible this peculiarity in its mode of action must be carefully observed. At first the living tuberculous tissue must be caused to undergo necrosis, and then everything must be done to remove the dead tissue as soon as possible, as, for instance, by surgical interference. Where this is not possible and where the organism is unassisted in throwing off the tissues slowly, the endangered living tissue must be protected from fresh incursions of the parasites by continuous applications of the remedy.

The fact that the remedy makes tuberculous tissue necrotic and acts only on the living tissue helps to explain another peculiar characteristic thereof—namely: That it can be given in rapidly increasing doses.

At first sight this phenomenon would seem to point to the establishment of tolerance, but since it is found that the dose can, in the course of about three weeks, be increased to 500 times the original amount, tolerance can no longer be accepted as an explanation. As we know of nothing analogous to such a rapid and complete adaptation to an extremely active remedy, the phenomenon must rather be explained in this way, that in the beginning of the treatment there is a good deal of tuberculous living tissue, and that consequently a small amount of the active principle suffices to cause a strong reaction, but by each injection a certain amount of the tissue capable of reacting disappears, and then larger doses are necessary to produce the same amount of reaction as before. Within limits, a certain degree of habilitation may be perceived as soon as the tuberculous patient has been treated with increased doses for so long as the point is reached at which reaction is as feeble as that of a non-tuberculous patient. Then it may be assumed that all tuberculous tissue is destroyed, and then the treatment will only have to be continued by decreasing doses and with instructions that the patient may be protected from fresh infections while bacilli are still present in the organism.

THE PROFESSOR CONFIDENT.

Whether this conception and the inference that follows from it be correct, the future must show. They are conclusive as far as I am concerned. The mode of treatment in our investigation was practiced in the following manner, to begin with the simplest lupus:

In nearly every one of these cases I injected the full dose of .01 cubic centimeter from the first. I then allowed the reaction to come to an end, and then, after a week or two, again injected .01 cubic centimeter, continuing in the same way until the reaction became weaker and weaker and then ceased. In two cases of facial lupus the lupus spots were thus brought to complete cicatrization by three or four injections. The other lupus cases improved in proportion to the duration of treatment. All these patients had been sufferers for many years, having been previously treated unsuccessfully by various therapeutic methods. Glandular, bone and joint tuberculosis was similarly treated, large doses at long intervals being made use of. The result was the same as in the

lupus cases—namely: a speedy cure in recent and slight cases, slow improvement in severe cases. The circumstances were somewhat different in phthisical patients, who constituted the largest number. Our patients with decided pulmonary tuberculosis are much more sensitive to the remedy than those with surgical tuberculosis affections. We were obliged to diminish the doses of the phthisical patients, and found that they almost all reacted strongly to .002 cubic centimeter and .001 cubic centimeter. From this first small dose even it was possible to rise more or less quickly to the amount that was well borne by other patients. Our courses were generally as follows: An injection of .001 cubic centimeter was first given to the phthisical patient, and from this a rise of temperature followed, the same dose being repeated once a day until no reaction could be observed. We then increased the dose to .002 cubic centimeter until this was borne without reaction, and soon increased by .001 or, at most, .002 to .005 cubic centimeter. This mild course seemed to be imperative in cases in which there was great debility. By this mode of treatment the patient can be brought to tolerate large doses of the remedy with scarcely a rise of temperature, but patients of greater strength were treated from the first partly with larger doses and partly with frequently-repeated doses. Here it seemed that the beneficial results were more quickly obtained. The action of the remedy in cases of phthisis generally showed itself as follows: Cough and expectoration were generally increased a little after the first injection, then grew less, and less, and in the most favorable cases entirely disappeared. The expectoration also lost its purulent character and became mucous. As a rule, the number of bacilli decreased only when the expectoration began to present a mucous appearance. They then entirely disappeared, but were again observed occasionally until expectoration completely ceased. Simultaneously the night-sweats ceased, the patients' appearance improved, and they increased in weight within from four to six weeks. Patients under treatment for the first stage of phthisis were free from every symptom of disease, and might be pronounced cured. Patients with cavities not yet too highly developed improved considerably and were almost cured, and only those whose lungs contained many large cavities could no improvement be proved objectively. Even in these cases the expectoration decreased and the subjective condition improved.

CAN BE CURED IN THE BEGINNING.

These experiences lead me to suppose that phthisis in the beginning can be cured with certainty by this remedy. This statement requires limitation, in so far as at present no conclusive experiences can possibly be brought forward to prove whether the cure is lasting. Relapses naturally may occur, but it can be assumed that they may be cured as easily and quickly as the first attack. On the other hand, it seems possible that, as in other infectious diseases, patients once cured may retain their immunity. But this, too, must for the present remain an open question. In part this may be assumed for other cases when not too far advanced. But patients with large cavities, who suffer from complications caused, for instance, by the incursion of other pus forming micro-organisms into the cavities, or by incurable pathological changes in other organs, will probably obtain lasting benefit from the remedy in only exceptional cases. Even such patients, however, were benefited for a time. This seems to prove that in their cases, too, the original tuberculous disease was influenced by the remedy in the same manner as in the other cases, but that we are unable to remove the necrotic masses of tissues with the secondary supperative processes. The thought involuntarily suggests itself that relief might possibly be brought to many of these severely-afflicted patients by a combination of this new therapeutic method with surgical operations, such as the operation for empyema, or with other curative methods. And here I would earnestly warn people against conventional and indiscriminate application of the remedy in all cases of tuberculosis. The treatment probably will be quite simple in cases in which the beginning of phthisis and simple surgical cases are concerned, but in all other forms of tuberculosis medical art must have full sway by careful individualization and making use of all other auxiliary methods to assist the action of the remedy. In many cases the decided impression was created that the careful nursing bestowed on the patient had considerable influence on the result of the treatment, and I am in favor of applying the remedy in proper sanitariums, as opposed to treatment at home. How far the methods of treatment already recognized as curative, such as mountain climate, fresh-air treatment, special diet, etc., may be profitably combined with the new treatment cannot yet be definitely stated, but I believe that these therapeutic methods will also be highly advantageous when combined with the new treatment. In many cases, especially in the convalescent stage, as regards tuberculosis of the brain and larynx and miliary tuberculosis, we had too little material at our disposal to gain proper experience.

A WARNING TO PRACTITIONERS.

The most important point to be observed in the new treatment is its early application. The proper subjects for treatment are patients in the initial stages of phthisis, for in them the curative action can be most fully shown; and for this reason, too, it cannot be too seriously pointed out that practitioners must in the future be more than ever alive to the importance of diagnosing phthisis in as early a stage as possible. Up to the present time the proof of tubercle bacilli in the sputum was considered more as an interesting point of secondary importance which, though it made diagnosis more certain, could not help the patient in any way, and which in consequence was often neglected. This I have lately repeatedly had occasion to observe in numerous cases of phthisis which had generally gone through the hands of several doctors without any examination of the sputum having been made. In the future this must be changed. A doctor who shall neglect to diagnose phthisis in its earliest stage by all methods at his command, especially by examining the sputum, will be guilty of the most serious neglect of his patient, whose life may depend upon the early application of the specific treatment. In consequence, in doubtful cases, medical practitioners must make sure of the presence or absence of tuberculosis, and then only will the new therapeutic method become a blessing to suffering humanity, when all cases of tuberculosis are treated in their earliest stage, and we no longer meet with neglected serious cases forming an inextinguishable source of fresh infections.

Finally, I would remark that I have purposely omitted statistical accounts and descriptions of individual cases, because the medical men who furnished us with patients for our investigations have themselves decided to publish the description of their cases, and I wished my account to be as objective as possible, leaving to them all that is purely personal.

HEALTH IN MICHIGAN, OCTOBER, 1890.

For the month of October, 1890, compared with the preceding month, the reports indicate that inflamation of the brain, measles, scarlet fever, membranous croup, pneumonia, typhoid fever (enteric), diphtheria and inflammation of bowels increased, and that cholera infantum, cholera morbus, dysentery and whooping cough decreased in prevalence.

Compared with the preceding month the temperature was lower, the absolute humidity was less, the relative humidity was slightly more, the day ozone and the night ozone were more.

Compared with the average for the month of October in the four years, 1886–1889, influenza, measles and pleuritis were more prevalent, and whooping cough, typho-malarial fever, puerperal fever, cholera infantum, inflammation of bowels, cerebro-spinal meningitis and dysentery were less prevalent in October, 1890.

For the month of October, 1890, compared with the average of corresponding months in the four years, 1888-89, the temperature was higher, the absolute humidity and the relative humidity were more, the day ozone and the night ozone were more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of October, 1890, at fifty-five places; scarlet fever at seventy-nine places; typhoid fever at ninety-six places, and measles at eighteen places.

Reports from all sources show diphtheria reported at two places less, scarlet fever at twenty-five places more and typhoid fever at twenty-three places more in the month of October, 1890, than in the preceding month. Measles were reported at the same number of places as in the preceding month.

Lansing, Mich., Nov. 7th, 1890. Henry B. Baker, Sec.

Sanitary science is no longer in the field of experiment. As a science it has been fully established and firmly placed upon a basis as true and solid as that of any of the other sciences.

GOOD SUGGESTIONS FOR BUILDING LAW.*

The general public is not aware that eleven fires alone destroyed over $30,000,000 during 1889. Just think of it, eleven fires costing on an average nearly $3,000,000 each. We destroy over $110,000,000 worth of property each year; we spend near $40,000,000 for managing a system of insurance tax; $30,000,000 are needed for the fire departments, our whole fire tax being near $190,000,000. Estimating our population at $64,000,000 this fire tax amounts to $3 per head for every man. woman and child in the United States. One half of this sum at least is the price we are paying for ignorance, carelessness and crime; the other half we cannot help, for fires have occurred for ages and will continue to occur, notwithstanding all precautions to prevent them; but it is a lamentable fact that our people have grown more careless thanthose any other nation, and that the means for preventing fires have not by any means kept pace with those for its extinguishment. Take up the report of a representative department, that of New York, and in 1866 the ratio of fires to buildings was fig. 1 to 80, and in 1889 it has risen by uneven steps to fig. 1 to 40. While the number of buildings increased 80 per cent and the population 120 per cent, the outbreaks of fire increased in number 250 per cent. The Insurance Commission of Massachusetts, in its report, estimates that full 90 per cent of all fires were preventable. These figures indicate very plainly that it is better buildings and increased precautions we need rather than improved apparatus or additional firemen.

At a public meeting in Boston, Inspector Damrell said: The subject of prevention supersedes that of extinguishment, and that we must build so as to confine the fires in the places where they started; if you wish to avert conflagrations separate the risks by fire walls so that fires can be confined. Prevent the erection of a building which, when a fire starts in it will not only destroy itself, but lay waste the property of its neighbors.

At the same meeting the fire commissioners expressed the opinion that it was not additions to the fire department or improved apparatus that was wanted, so much as better buildings that were able to resist fire. In fact it is now being accepted as law by the insurance experts and those who are intimately concerned, that it is only by the most careful inspection and improved methods of building that we can ever hope to reduce the fire waste of this country.

The walls of all warehouses, stores, factories and buildings intended to contain merchandise, machinery or humanity should be of the most substantial construction. The joists, girders, posts and interior framework should be so constructed that the entire contents might be burned and destroyed without danger to the inclosing walls. If the architeet could be prevailed upon to design his bhilding so it could safely cremate its own contents, then it would be impossible for any fire to spread to any serious extent, and the conflagration hazard could be wiped out of existence. The eleven fires of last year would have been impossible, and immeasurably less would have been the danger to life and property.

When it is borne in mind that falling walls are of frequent occurrence and that when one building gives way the one standing next to it usually falls also, and when it is considered that this flimsy method of construction as now practiced furnishes all the most favorable conditions for a conflagration, the wonder is that each city is not in turn destroyed block for block.

It is a high tribute to the efficiency of the American firemen that conflagrations are not of more frequent occurrence, and with no small amount of pride can we assert that the American firemen are head and shoulders above those of any other nation, and while the firemen are doing all that is possible to do, nevertheless it is much the best economy to prevent fires rather than trust to our ability to extinguish them.

For the last few years the loss of life at fires averaged near five hundred yearly, and we can call to mind many brave and fearless firemen who are among that number. Hardly had our last convention closed, when Major Hughes was called home by telegram to mourn the loss of five men who were buried under falling walls. Following soon after this came Philadelphia with one dead and several injured; at Lynn another lost his life; then the big fire at Boston took away four at one time. This list could be kept up indefinately, but we will close with the most fearful of home, Indianapolis, twelve being killed at once and many others injured.

It is certainly a sad commentary on our methods of building to know that the collapse of a single post or the falling of a few joists should cause the whole building to fall. Should we, then, as firemen, stand back and say nothing? Is it not our duty to cry out and call upon our government, both state and national, to correct these evils in building? Take up the building ordinances of all the larger cities, and you will find no two of them alike; uniformity is a term unknown. Examine more closely and you will discover many paragraphs to be unnecessary or so ambiguous as to be misunderstood.

It is a strange commentary on the intelligence of this great nation that not a single state in the Union has a comprehensive building law, classified to meet the varying wants of its different cities. Not a single city in this country has an ordinance that can be considered perfect, or nearly so. That of Louisville, just passed, is said by architects and builders to be impracticable, even using names and terms unknown to the trade. The Mayor of Boston has just appointed a committee for the purpose of revising an admittedly bad and patched up ordinance. In New York state a bill was recently introduced at Albany providing the appointment of a commission of three experts to draft suitable laws for the construction of buildings in the state. This bill fell through, possibly because the average statesman did not appreciate its importance. New York City has had a commission at work for months revising and correcting the law, and intended to have the amendment passed by the last legislature, but the underwriters found some room for improvement, and succeeded in delaying its passage until next winter. St. Paul, Minneapolis, Baltimore, Philadelphia and Memphis are at work seeking to improve their laws; all this work showing conclusively, and admitting, the defects now existing.

This subject of improved methods of building should receive our most earnest and careful deliberation, for it concerns the financial welfare of this country, the personal safety of ourselves and the life and property of those who are so unfortunate as to occupy these badly constructed buildings during a fire.

There are other national bodies who should be as deeply interested as ourselves, and we have every reason to believe they are, namely: The American Institute of Architects, The National Association of Builders, the National Board of Underwriters and the National Association of Building Inspectors. It does not seem improper, therefore, for this association to ask the co-operation of the national bodies mentioned for the purpose of framing a "model building ordinance." Such a model, framed and promulgated under their combined co-operation, would be eagerly adopted by all cities, and would have a wonderful effect in improving our present methods of building.

This association should be the first to take some action in the matter. Nothing we could do would be more commendable. Nothing we could do would be of such importance. Nothing we could do would be considered a greater blessing. Nothing we could do would bring us into more favorable prominence than to be the prime movers toward getting a uniform and model building ordinance framed and adopted.

The people generally seem to think that a great fire or conflagration is an act of God, and find consolation in insurance, forgetting that insurance companies merely distribute the burden on the multitude with about forty per cent added to pay dividends and expenses. The people generally are not aware that the greater the fire waste the greater the tax on the people. Insurance is now considered a legitimate and necessary expense, and anyone is counted as negligent indeed who meets with a loss by fire and is not insured against such a loss. Insurance, therefore, is a tax, amounting at the present time to near one per cent on all our taxables. A reduction of this tax is an important matter and lies wholly in the hands of the people, and can be brought about only by greater care in preventing fire and by better methods of building. The mutual insurance companies have demonstrated beyond a doubt that it pays to put up better buildings and protective apparatus. From actual results we find that

*Paper read by Henry F. Goetz, of New Albany, Ind., at the convention of the National Association of Fire Engineers at Detroit.

the rate on a textile mill was formerly two and one-half per cent, while the rate last year was only one-fourth per cent. The president of a prominent stock company would make good money at one-third the present rates if fires could be confined in the buildings in which they originated.

Losses by fire from interior causes seem unpreventable, but those from exposure, that is where fire extends to adjoining property, can be prevented by the erection of better buildings, having substantial fire walls.

The *Chronicle* fire tables show a loss from exposure during 1889, amounting to $50,000,000, the total loss from all causes being $125,000,000; sixty per cent, therefore, representing the loss from all causes and forty per cent that from exposure alone.

After any great fire there is usually considerable criticism floating in the air condeming the management at a fire, and the firemen generally get the blame if anyone is hurt by falling walls. Did you ever hear any one ask or inquire during a fire about the details of construction, and how it might be improved? Did anyone ask for the name of the architect, the builder and the owner? Is the architect censured for permitting his judgment as to safety to be overcome by the economical ideas of the owner? Is the builder ever called to account or brought before a jury for putting up such a flimsy death-trap? Is the owner ever summoned before a judge to answer for the damage caused to adjacent property through his negligence, or to answer for the victims that were burned and scorched? No; none of these are at fault. It is the chief; it is the firemen that get all the blame. I need only refer to the newspapers for evidence. This way of criticising matters should be changed, and it can be done,

One chief in his report says: "Had the walls of the building been sufficiently strong the fire would have been confined to that building alone, and the loss would not have been more than one-third what it really was." Another says: "If the walls had remained standing the loss would have been very much less." Another says: "The walls fell early, exposing much property that lay next to it." Now this is entirely too lenient with the owner, and much stronger language should have been used, giving the figures of total loss and also of the preventable one. We have become so accustomed ta walls falling that we take it as a matter of course and not to be helped. This habit our builders have of making thin party walls do double service and of propping up these buildings against each other, will not do. Compel owners to build so that a structure will stand alone should those adjacent be removed. Compel builders to put up a building so that the entire interior of the same could burn out without damage to the exterior walls.

Draw out these facts especially in your reports, with a view of educating and instructing the people, and there will certainly be a public opinion aroused that will correct these evils and make it a crime against the safety of the public for anyone to build these thin, weak and unsafe party walls. Methods of anchoring should be corrected, for at the present if the joists fall the anchors cannot free themselves and therefore the wall is pulled down. You must explain in your reports what made the walls fall and insist on some method of anchoring joists being used so that falling joist shall free their anchorage and leave the walls standing, remembering all the while that nothing in existence can resist a fire so well or so long as a standing brick wall.

REGISTRATION OF PLUMBERS.

Under the auspices of the National Registration of Plumbers District Council, a meeting was lately held in the High School at Arbroath for the purpose of considering the formation of a class under the programme of the City and Guilds of London Institute. Provost Keith presided, and was supported by Mr. McBain, banker, Mr. Ross, rector of the high school, and other prominent citizens. There was a large attendance of journeymen and apprentice plumbers, a few of the masters being also present. The chairman referred in congratulalory terms to the advances of science in relation to plumber-work, hoping that those present would embrace the opportunity offered by such advances, and introduced Mr. A. L. Peacock, teacher of plumbing in the Technical Institute, Dundee, who then gave his introductory lecture on "Lead: its various properties, methods of preparation, qualities, sizes, weights, applications and behavior when exposed to action of gases," instancing the galvanic action set up by lead in proximity to zinc immersed in water, and concluding by referring to the importance of a knowledge of electricity to plumbers, both as a branch of business and as enabling them to avoid mistakes in their more ordinary work. Mr. Henderson, secretary of the Registration District Council, then spoke of the origin, progress and importance of registration when combined with such a scheme of specialized technical education as had been drafted by the Plumbers' Company, whereby a boy intending to be a plumber would have his arithmetical and geometrical studies brought to bear upon the facts of his future work, and concluded by moving a vote of thanks to Provost Keith for presiding, which was heartily given. Mr. McBain, Mr. Ross and Mr. Symon also addressed the meeting, expressing the hope that some young plumber would honor Arbroath by bringing to it a medal, as a student of masonry had already done, and that the lecture would doubtless excite the curiosity of the pupils for further knowledge. At the close, explanations were given, and a number of names enrolled as students.

AMONG THE PLUMBERS.

In order to become a plumber in New York City the applicant must register his name and address with the Health Department, and a failure to do this subjects the would-be plumber to arrest, besides the courts refuse to render any assistance if he has to sue for money on a plumbing contract. The privilege to make sewer and water connections outside the building upon which he is at work must be secured by a license from the Department of Public Works.

The *Sanitary Plumber*, of New York City, has just started on its ninth volume, and continues to maintain its high standard as a first-class plumbing paper.

William Gay, of the firm of Gay & Culloton, is just recovering from a siege of intermittent fever.

The Cooper Manifold Water Heating Company, Chicago, has been organized to manufacture and apply a continuous circuit hot water heater. Capital stock, $1,500,000. Incorporators, Russell Bottsford, Kirby R. Brockenbrough, and others.

Bernard J. McBride, the Democratic candidate from the second district in Brooklyn, N. Y., defeated his opponent, Mr. G. Alfred Smith, by a good, round majority. With Mr. McBride to look after the interests of the New York plumbers in the next State Assembly, the craft should be able to secure about all it desires.

The journeymen plumbers of Lincoln, Neb., have compelled some of the master plumbers of that city to show their books in order to ascertain whether they were paying their men less than the regular scale of wages.

Joseph P. Castigan, of St. Paul, Minn., has been granted a patent for a pipe joint, peculiarly suited for water and gas pipes. Mr. Castigan has invented several very valuable patents, but this one promises to eclipse them all.

The plumbing business of Edward Doherty, of Kansas City, Mo., in the future will be run under the firm name of Doherty Bros.

P. J. Ryder, of the firm of O'Brien & Ryder, 140 Spring street, New York City, was elected alderman of said city at the recent election.

The Coshocton Lead & Zinc Co., of Carthage, Mo., has filed articles of incorporation. The capital stock is $20,000. The shareholders are: J. C. Fisher, Wm. Burns, Wm. Ward, Edward Hanlon, W. S. Miller, F. C. Hay, J. P. Forbes and Bethel Puckett, of Carthage,

Fred Dold, of Port Chester, N. Y., will soon have an elegant plumbing and gas-fitting shop on Lower Main street, which will be fitted up to the Queen's taste.

The master plumbers of Tacoma, Wash., are endeavoring to draft rules which shall settle all differences arising between the masters and journeymen.

G. D. Grun, Secretary of the Master House Painters and Decorators of the State of Illinois, informs us that the association will convene in Chicago the second Wednesday in January, 1891. A more perfect organization will be established at this meeting so

that the interests of the profession may be better protected and advanced.

James H. O'Neill writes that he wants several good plumbers to come to Lincoln, Neb., where good wages and steady work will be guaranteed.

Peck Bros., are at work on an elaborate catalogue of plumbing and sanitary supplies, which they hope to have completed by the first of the year. This production will far surpass any of their former catalogues of goods.

The Ladies' Auxiliary Society of the Chicago Master Plumbers' Association, will entertain the members of the Association on Thanksgiving evening at Grand Army Hall. The plumbers will all be invited to bring their wives and best girls and have a good time generally. All who have attended the socials of the Ladies' Auxiliary Society, well know the royal entertainments they are capable of giving and the ladies are expecting to surpass any previous entertainment given by them on this particular evening. All those who are invited should not fail to attend the Thanksgiving party.

Copies of the proceedings of the Denver convention are being prepared for shipment as fast as possible at the national headquarters of the association, and Mr. Griffith hopes soon to have all the members furnished with copies.

Mr. J. J. Hamblin, Financial Secretary of the National Association of Master Plumbers, who has done so much for the elevation of the plumbing trade, advocates forming a night school among the apprentices and journeymen. Mr. Hamblin offers to meet with the boys on such evenings as they select, and give them instruction in the various branches of plumbing. He is very earnest in impressing upon the minds of the future plumbers the fact that "knowledge is power." We know of no better illustration of this fact than Mr. Hamblin himself. He always inquires why a thing is so and never takes any thing for granted. The result of this thoughtful turn of mind is, that Mr. Hamblin, besides building up a trade of which any plumber might be proud, occupies one of the foremost positions in the plumbing profession. Mr. Hamblin is always very punctual in his attendance at the meetings of the Chicago Master Plumbers' Association, and since the organization of the society he has not missed more than a dozen meetings, and in these cases he has been absent from the city on business. What plumber can show a better record than this?

Robert Griffith is out of the city on business.

President Hugh Watt is still unable to attend the metings of the Chicago Master Plumbers' Association and David Whiteford, Vice President of the association, is now the acting President.

John J. Carey, who was Secretary of the National Association of Master Plumbers, under ex-President John Trainor, has been in the city for several days calling on the master plumbers. Mr. Carey is now traveling for the firm of James McLewee & Sons, 25 Waverly Place, New York City.

Chief Inspector Andrew Young has been laid up several days this week with a cold, but the smoke nuisance gets no vacation, for Mr. Young's assistants are continuing the good work with unabated energy.

In a note to the associate editor of the SANITARY NEWS, under date of Nov. 18th, from Mr. W. M. Webster regarding the item in our last week's issue referring to that gentleman and his future intentions, he desires us to correct an error that reported him as the "General Manager" of the L. Wolff Manufacturing Company in the past and a like capacity in his present position with the J. L. Mott Iron Works. The article should have read that Mr. Webster was the Manager of the Dearborn street house of the L. Wolff Manufacturing Company, and is at present Manager of the Plumbing Department of the J. L. Mott Iron Works in the West. The error crept into the columns in the office, and Mr. Webster kindly and modestly asks us to correct any erroneous impression that may have been formed by the former publication, which is characteristic of him.

REVIEWS AND NOTES.

The *Popular Science Monthly* will make a new departure in 1891 by publishing a series of comprehensive and fully illustrated articles on "The Development of American Industries since Columbus." It has been announced that one of the features of the coming World's Fair is to be a comparison of the great manufactures of to-day with the condition of the same industries at the discovery of America, and it is the design of these papers to describe the successive steps by which the distance between those two stages has been passed over. The series begins in the issue for December, 1890, (the second number of Volume Thirty-eight), with an account of the first steps in iron making in the colonies, written by Mr. W. F. Durfee, of Pennsylvania. The full prospectus of the monthly for the coming year will be printed in the same number.

B. P. Bower & Co., of Cleveland, Ohio, have issued a neat, illustrated catalogue setting forth the virtues of the well-known Bower sewer-gas trap. The trap with the different attachments made is nicely illustrated, and its advantages clearly marked. The Bower trap, as is well-known, is an effective seal against back pressure, and its claims for public recognition are well founded. The catalogue contains much interesting reading to plumbers, house owners, sanitarians and the public generally.

The Chicago *Journal of Commerce* comes to us in a new and greatly improved form. It now consists of fifty-six pages and a handsome cover. It is made more convenient, more attractive, and better in every way. Its contents were always good and need no improvement.

"The New Method in Certain Chronic Diseases," by W. E. Forest, B. S., M. D. (New York, M. L. Holbrook & Co., 710 Broadway.) The author is a practicing physician in New York, and this work is the outgrowth of his professional experience. His method is not a theory, but a practical demonstration. It is simple, inexpensive and adapted to the conditions and convenience of patients at home. Its natural common sense commends it, and the tests it has withstood in its practical application to diseases warrant a place for it in the confidence of the people and advanced therapeutics.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Orwigsburg, Pa.: The Valley Railroad is about to erect additional buildings.——Ashville, Ala.: The Ashville Railroad Company is about to erect a new depot.——Catasauqua, Pa.: Front street, Lower Catasauqua, silk factory; cost, $20,000. L. S. Jacoby, architect.——Cleveland, O.: Euclid street, near Erie avenue, a brick business building; cost, $20,000. Geo. H. Smith, architect. ——Bloomfield, N. J.: The congregation of the Westminster Presbyterian Church will erect a new church edifice from plans prepared by Architect A. B. Jennings, of New York. The new structure will cost $30,000.——Chicago: No. 626 Congress street, three-story and basement residence; cost, $15,000. Lamson & Newman, architects. 213 Seminary avenue, two-story and basement flat building; cost, $10,000. Same architects. Indiana avenue and Twenty-fourth street, apartment and hotel building; cost, $200,000. H. B. Wheelock, architect.. Fifty-sixth street and Woodlawn avenue; cost, $12,000. William Thomas, architect. Congress street and Kedzie avenue, five two-story and basement flat buildings; cost, $15,000. J. D. Hallock, architect. Van Buren and Morgan streets, four-story store and flat building; cost, $20,000. C. S. Corwin, architect. State and Pearson streets, four-story store and flat building; cost, $25,000. J. Addison, architect. Madison street, near Sacramento avenue, three-story and basement store and flat building. Hetherington & Warner, architects. Ogden avenue and Wood street, three-story store and flat building; cost, $32,000. D. A. La Pointe, architect. Fifty-sixth street, near Cornell avenue, four-story and basement apartment building; cost, $30,000. George W. Maher, architect. Fiftieth street, between Drexel boulevard and Cottage Grove avenue, two three-story frame buildings; architect, C. G. Ferree. The same architect is making plans for a three-story store and flat building to be erected at Normal Park; cost, $10,000. Auburn Park, two-story flat building; cost, $12,000. Same architect.——Brooklyn, N. Y.: Sixth street, near Fifth avenue, five three-story brick dwellings; cost, $20,000. Allan Bros., architects. Corner Clermont and Flushing avenues, a three-story brick station; cost, $38,000. Geo. Ingram,

architect. Oxford street, near Lafayette avenue, a five-story brick and stone flats; cost $40,000. M. W. Morris, architect. Macon street, near Patchen avenue, five two-story brick dwellings; cost, $20,000. Eighth avenue and Windsor place, a three-story brick store and dwelling building; cost, $22,000. Walter A. Fischer, architect. Douglas street, near Franklin avenue, five four-story brick tenements; cost, $35,000. Henry Volhveiler, architect. Bainbridge street, near Saratoga avenue, ten two-story brick and stone dwellings; cost, $45,000. J. M. Kirby, architect. Tenth street, near Eighth avenue, five three-story brick flats; cost, $35,000. J. D. Reynolds & Sons, architects. Ninth avenue, near President street, a five-story building. Geo. M. Huso, New York City, architect. Corner Washington and Park avenues, a five-story warehouse; cost, $65,000. J. G. Glover, architect. Chauncey street, near Stuyvesant avenue, six two-story brick dwellings; cost, $27,000. S. W. & C. J. Dodge, architects. Macon street, near Lewis avenue, four two-story dwellings; cost, $24,000. J. S. Stevens, architect. Palmetto street, near Knickerbocker avenue, eight two-story dwellings; cost, $20,000. Frank W. Ames, architect. Scholes street, near Bushwick avenue, three four-story brick buildings; cost $28,000. Chas. Stolt & Son, architects. Kent avenue and North Ninth street, a three-story brick office building; cost, $20,000. Geo. B. Post, architect. Eighth street, near Sixth avenue, eleven two-story dwellings; cost, $50,000. W. M. Coots, architect.——New York City: Eighty-third street, near Eighth avenue, seven three-story brick dwellings; cost, $112,000. Frederick T. Camp, architect. 107th and 108th streets, near Amsterdam avenue, a three-story brick stable; cost, $80,000. Lederle & Co., architects. 142d street, near Third avenue, four five-story brick flats; cost, $88,000. John C. Burne, architect. 120th street, near Eighth avenue, three five-story brick tenements; cost, $33,000. John C. Kerby, architects. Corner Fifth avenue and Thirty-third street, an eleven-story brick and stone hotel building; cost, $1,000,000. H. J. Hardenburgh, architect. 115th street, near Fifth avenue, two five-story brick flats; cost, $36,000. F. S. Barns, architect. 119th street, near Third avenue, one five-story brick store and flat building; cost, $23,000. A. B. Ogden & Son, architects. Seventy-second street, near First avenue, two five-story brick stores and flats; cost, $20,000. Andrew Spence, architect. Rivington street, near Cannon street, a six-story brick store and flat building; cost, $63,000. Herter Bros., architects. Eighty-fourth street, near Amsterdam avenue, three five-story flat buildings. Thom & Wilson, architects. Central Park West, near Eighty-third street, a seven-story brick and stone apartment house. Danmar & Fischer, architects. Sixty-fifth street, near Central Park West, two five-story tenements; cost, $45,000. Geo. Keister, architect. Corner Alexander avenue and 141st street, five five-story brick flats; cost, $80,000. Andrew Spence, architect. Seventy-third street, near First avenue, four five-story brick flats; cost, 20,000. Thom & Wilson, architects. 408-410 East Fourteenth street, a five-story brick storage building; cost, $25,000. C. Stoll & Son, architects. ——Bethlehem, Pa.: A number of capitalists, among whom is Hon. Charles Broohead, will organize a stock company for the purpose of erecting a large summer hotel at Saylor's Lake.——Johnstown, Pa.: St. John's Catholic congregation will erect a school to cost $25,000, and the Cambria Iron Co. will erect an addition, to cost $35,000.——Baltimore, Md.: Permits have been issued to P. C. Hennighausen, to erect six two-story brick dwellings; to James A. Dyatt, to erect one three-story brick dwelling; to Elizabeth Johnson, to erect one three-story brick dwelling; to Samuel T. Edet, to erect two three-story brick dwellings; to the Hampden M. E. Church congregation, to erect a one-story frame addition.——Pittsburg, Pa.: Mrs. Sarah Savage will erect a large hotel building. J. W. Offerman has prepared plans for the following new buildings: Two two-story brick and frame dwellings to be erected on Centre avenue; a school-building to be erected on Dithridge street, and a three-story brick dwelling to be erected on Fulton street.——Scranton, Pa.: An English lace factory will be erected; cost, $300,000.——Media, Pa.: The Baptists will erect a new edifice.—— Edge Hill, Pa.: A new hotel will be erected.——Harrisburg, Pa.: The Leland Hotel will be enlarged, at a cost of $25,000.——Charleroi, Pa.: A three-story brick business block will be erected. Address Miss Phobe Wilson.——Washington, D. C.: Rev. E. A. McGurk will erect seven two-story dwellings; cost, $22,800. Samuel Norment will erect ten two-story brick dwellings; cost, $20,000.——Bayonne, N. J.: L. H. Broome is preparing plans for the new city-hall building; cost, $50,000.——Trenton, N. J.: A three-story brick and stone extension to the State Normal School building will be erected. L. H. Broome, of Jersey City, architect.——Athens, Ga.: R. L. Moss will erect a hotel building; cost, $40,000.——Chattanooga, Tenn.: A large hotel building will be erected on Cameron Hill; cost, $250,000.——Dallas, Tex.: The Oriental Hotel building will cost $600,000.——Edge Hill, Pa.: A three-story stone hotel will be erected; cost, $20,000.——Atlanta, Ga.: A ten-story office building will be erected; cost, $500,000. Burnham & Root, Chicago, architects.——St. David's Pa.: The Pennsylvania Railroad Co. will erect a brick passenger station.——Chattanooga, Tenn.: The *Times* Printing Company will erect a new building, to cost $120,000.——Norwich, Conn.: A new hospital building will be erected; cost, $50,000.——Bristol, Conn.: A new Masonic temple will be erected; cost, $20,000.——Malden, Mass.: The trustees of the hospital fund have been instructed to secure plans for a new building, to cost $35,000.——Auburn, Me.: A new library building will be erected.——Boston, Mass.: Huntington avenue, six brick apartment buildings; cost, $120,000. E. H. Boyden, architect. Falmouth and Gainsborough streets, a brick church; cost, $65,000. Rotch & Tilden, architects. Huntington street, a brick apartment building; cost, $100,000. Keening & Strout Bros., architects. Conant street, a brick brewery, boiler-house and alteration; cost, $60,000. L. Weisbein, architect. White street, a frame church; cost, $20,000. J. S. Eastman, architect. 520 East Broadway, a brick apartment building; cost, $22,000. Rand & Taylor, architects. 528 Marginal street, a brick storehouse; cost, $60,000. F. Wunder, architect. Commonwealth avenue, a brick dwelling; cost, $43,000. Commonwealth avenue, a brick dwelling; cost, $35,000.——Cincinnati, O.: Freeman and Louisa streets, a two-story packing and smoke house; cost, $75,000. A. J. Bast, architect. Pearl and Central avenues, a three-story brick and iron warehouse; cost, $75,000. S. W. E. Field, architect. The Perin estate will build a pressed-brick store and flat building on the northwest corner of Fifth and Race streets, to cost $200,000. Samuel Hannaford's Sons are the architects.——Minneapolis, Minn.: 2500 Park avenue, a frame dwelling and barn; cost, $30,000. A. L. Dorr, architect.——Mount Holly, N. J.: Mr. Dunlap, the carpet manufacturer of Philadelphia, will erect about forty dwellings for his employes.——Harvey, Ill.: Eight buildings; cost, $50,000. Address the Budor Foundry and Manufacturing Co.——Jasper, Tex.: A large hotel is to be erected by a stock company.——Johnstown, Pa.: Corner Walnut and Main streets, brick addition to Cambria club-house; cost, $15,000. Addison Hutton, Philadelphia, architect. Corner Franklin and Main streets, brick business block; cost, $25,000. McBride & Gray, Pittsburg, Pa., architects.——Dawson, Ga.: It is proposed to spend the sum of $30,000 on the projected court-house.——Detroit, Mich.: Farnsworth street, between Hastings and Revard streets, eleven two-story frame residences; cost, $30,000. R. M. Bahan, architect.

HEATING AND LIGHTING.

Indianapolis, Ind.: The question of public lighting for the city still remains unsettled. The Mayor can furnish particulars.——Ashbourne, Pa.: An electric lighting plant is to be established.——East Liverpool, Ohio: A system of electric lights is to be established. For particulars address Mr. McKeehan.——Elgin, Ill.: An electric light company has been organized. Address Alderman Joslyn for details.——Charleston, S. C.: The Charleston Electric Light and Power Company has decided to make extensive improvements to its plant, including the addition of considerable machinery.——Stamford, Conn.: Extensive alterations are to be made to the electric lighting plant. The Borough clerk can furnish particulars.——Chicago, Ill.: The Morgan Gardner Electric Company has been organized for the manufacture of electric mining machinery and other electric devices. Incorporators, Henry A. Gardner, James P. Gardner, and George C. Gardner. Capital stock, $100,000.

SEWERAGE NOTES.

Troy, N. Y.: A change is to be made in the grade of the sewer between Harrison and Tyler streets.——Knoxville, Tenn.: The plans and specifications for a complete system of sewerage

prepared by Nier, Hartford & Mitchell, of Chatanooga, have been referred to the city engineer, who will report upon them.——Ashland, Ky.: Mr. Frank Snyder, hydraulic engineer, of Columbus, O., who was engaged to prepare plans for the sewerage of this town, has made his final report to the committee. The plans were unanimously adopted.——Wilmington, N. C.: The Board of Aldermen has appropriated $1,500 for the purpose of securing the services of a sanitary engineer, and for having plans and specifications made for a system of sewers. The Legislature will authorize the issue of bonds for $200,000 for a complete system. ——Montgomery, Ala.: Mr. Rudolph Hering, consulting engineer, of New York, has submitted his final report, dealing with the maintenance of sewers.——Charlottesville, Va.: It is proposed to put in a system of sewers at once. A city engineer is soon to be appointed.——Phœnix, Ariz.: The city is seeking information on the subject of sewers, with the intention of constructing a system within a year or so.——Springfield, Mass.: A report has been presented as to the prevention of overflowing of the sewers. Overflow sewers and the reconstruction of old sewers is recommended.——Buffalo, N. Y.: On Niagara street a 30 and 27-in. brick and 20, 18 and 15-in. tile sewer is to be constructed. ——Columbus, O.: Ordinances have been passed to provide for the issue of bonds for two trunk sewers.——Cordele, Ga.: An election for or against issuing bonds for sewerage system will be held November 27. Address G. M. McMillan, Mayor.——Rochester, N. Y.: Numerous important sewer extensions are to be made. Address City Clerk Sheridan, for details.——Salem, Mass.: It is proposed to expend the sum of $4,400 for establishing sewers in the Fourth Ward. The City Clerk can furnish particulars.——Bristol, Conn.: The officials are agitating the question of an improved system of sewers. The scheme approved by the State Board of Health, is to carry the sewerage through an 18 inch pipe to a tract of 10 acres, a mile and a half from town, where it can be disposed of by filtration.——Manchester, Va.: The question of establishing a system of sewers is being discussed by the officials. Address the Town Clerk for details.——Pittsburg, Pa.: It is proposed to improve the sewerage system of the south side of the city. For particulars address Dr. G. B. Sweeney.——Atlanta, Ga.: The project to extend the sewerage system of this city, at an estimated cost of $95,000, has been postponed indefinitely.

WATER-WORKS NOTES.

Portland, Ore.: Superintendent I. W. Smith has been ordered to prepare plans and specifications, and to ask for bids for the same.——Stockton and Oakland, Cal.: The Blue Lakes Water Company will lay a 40-inch pipe line to Stockton, and a 30-inch line from there to Oakland, the latter line being 75 miles long. ——Harrodsburg, Ky.: The town wishes a company to build works, and will receive bids at once, on the basis of 60 hydrants for 20 years. A large spring, or Salt River, one mile from town, is available for supply. A stand pipe is preferred. Estimated cost, $60.000 to $75,000. Address W. K. Cardwell.——Cincinnati, Ohio: A joint committee from some of the city commercial organizations is investigating methods for obtaining a new or additional supply, which is badly needed.——Glendale, Ohio: Messrs. Going, Heady and Porter have been appointed a committee from the city council to consider the construction of works. ——Van Buren, Ark.: The city is ready to grant a 25 or 30 years franchise to a company. Address H. C. Hayman.——Horton, Kan.: L. H. Smyth informs us that the city contemplates putting in works, and is ready to open negotiations to that end.——Lexington, Neb.: Bonds were voted Oct. 29th for the construction of works to cost not over $18,000. Contracts will be let Nov. 29th. Address C. A. Edwards.——Centralia, Ill.: The date of constructing works is indefinite.——Madison, Ill.: The Madison Water-works, Lighting and Power Company has been incorporated with a capital stock of $20,000.——Parkersburg, Iowa: Works are still being discussed. Address W. H. Owen, Mayor. ——Harriman, Tenn.: Temporary works have been put in, and permanent works will probably be built by the East Tennessee Land Co.——North and West Knoxville, Tenn.: The councils of these two towns are still considering the proposition of D. T. McIntyre, G. W. Sturtevant, Jr., and others, and also the proposition of the Knoxville Water Company.——Arkadelphia, Ark.: G. W. Carder is advertising for bids for the construction of a system of water-works.——Cranford, N. J.: A system of water-works is to be established by a newly organized company.——Griffin, Ga.: It is proposed to expend the sum of $75,000 on the projected system of water-works and electric lights. For particulars address W. A. Robinson.——Westchester, N. Y.: The New York & Westchester Water Company has been incorporated with a capital stock of $500,000. The company's sources of supply are intended to be from springs, streams, wells, and artesian wells, or other available sources of supply. The incorporators are John F. Hume, of Poughkeepsie, and others.——Quincy, Ill.: The movement to establish a system of water-works at this place is rapidly maturing, and it is expected that important steps toward that end will soon be taken. An engineer is now making estimates regarding the probable cost of the undertaking, and a special meeting of the city council will be held shortly to take decisive action.——Whitestone, L. I.: The estimated cost of the new plant is $35,000. For further particulars address C. B. Williams, Secretary of the Board of Water Commissioners.——Forest Grove, Ore.: The Gales-Peak Water Company will expend the sum of $100,000 on a system of water-works. The towns of Cornelius and Hillsboro will also be supplied. For particulars address C. M. Keep.——Saginaw, Mich.: Several thousand feet of water main extensions are to be made in this city. For full particulars address Mayor Weadock.——Darlington, S. C.: The Darlington Light, Water & Power Co. has been incorporated with a capital stock of $25,000. L. M. Cox, of the National Electric Light Company, Washington, D. C., F. Dargan and C. B. Edwards are interested.——Atlanta, Ga.: Hall Bros. have completed and reported upon their survey of Long Island Creek as a new source of supply. They recommend that the city purchase the entire water shed of the creek, build an impounding dam near the mouth of the creek, erect a steam or water-power pumping plant near the dam, lay a force main and construct a distributing reservoir. The estimated cost of the impounding dam and reservoir is $54,625.——Milledgeville, Ga.: At a recent citizens' meeting a motion was carried to the effect that the city council call a special election to decide whether works shall be built.——Yorkshire Center, N. Y.: Some parties have been here from Stamford, N. Y., looking up the matter of water-works. Address D. S. Churchill.——Sequachee, Tenn.: The citizens contemplate erecting water-works soon. E. E. Smart is the general manager of the company.——Cincinnati, Ohio.: The new B. C. A. will probably advertise for pumping machinery for the water-works very soon; 60,000,000 gallons capacity per day will be added to the present capacity.——Madelia, Minn.: Plans and specifications for a plant will be on file in about 30 days. Address C. C. Cooley.——Canton, S. D.: A. A. Richardson, consulting engineer, of Lincoln, Neb., has finished plans for a system of water-works and bids are now wanted, to be opened December 1st.——Coal Creek, Col.: Bids are wanted for laying one mile of water mains, 3-inch iron pipe; also, one circle reservoir, 50 feet in diameter.——Rockaway, L. I.: The Queens County Water Company proposes adding 50 feet to its stand pipe in order to secure a greater volume of water, and give additional force in distributing it through the mains.——Lisbon Falls, Me.: The tax-payers propose to establish a system of water-works at once. For further particulars address Hon. W. H. Newell.——Rochester, N. Y.: Several additional water mains are to be laid. For particulars address City Clerk Sheridan.——Mishawaka, Ind.: Water works will be established by a local company in connection with town authorities. The pumps will be two compound condensing; capacity, 3,000,000 gallons.——Rockford, Iowa: Mayor C. Yorker is ready to receive bids for the construction of a plant.——Sorrento, Me.: Plans, etc., embracing five different schemes of piping, for a system of water-works, have been submitted by the engineer, M. M. Tidd, of Boston, Mass., to the Frenchman's Bay Land & Water Company. Water will be taken from Long Pond, five miles distant. ——Fort Smith, Ark.: M. M. Tidd, C. E., of Boston, Mass., is preparing plans for additions, etc., to the water-works system. Improvements are contemplated in the reservoir capacity, pumping machinery, etc.——Westboro, Mass.: Plans for a system of water-works for the Lyman school for boys are being prepared by the engineer, M. M. Tidd, of Boston, Mass. Water will be

taken from Chauncey pond and pumped into a standpipe to be located on the summit of the hill in the rear of the present school buildings.

BIDS AND CONTRACTS.

Toronto, O.: Proposals will be received by the trustees of water-works, O. Y. Crawford, secretary, of the city of Toronto, Jefferson County, Ohio, at their office, until noon of Dec. 3, for furnishing vertical pumping machinery having the capacity to pump 3,000,000 United States gallons of water per 24 hours. Bids will be received for one or more pumping engines of above capacity, and also for one or more pumping engines each with capacity to pump 1,500,000 gallons. Also for two return tubular boilers, each 5 feet diameter and 14 feet long, including foundations and the placing the machinery thereon, together with all pipes, valves and fixtures for both steam and water, inside the building. Also including boiler foundations, settings and fixtures complete.——Bay City, Mich.: Sealed proposals will be received at the office of the Supervisng Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 4th day of December, 1890, for all labor and material required for the excavation, concrete foundations, stone and brick work of the basement and area walls, first floor iron beams and girders and columns in basement, for the U. S. court house, post-office and custom-house building, at Bay City, Mich., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Bay City, Michigan.——Ballinger, Tex: Proposals are wanted until January 1, 1891, for the construction of a system of water-works. Address Mayor B. S. Taylor. ——Helena, Ark.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., unti 12 o'clock P. M. on the 3d day of December, 1890, for furnishing all the labor and materials required for the erection and completion (except heating apparatus and approaches) of the U. S. court-house and post-building, at Helena, Arkansas, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Helena, Arkansas. Jas. H. Windrim, Supervising Architect.—— Poughkeepsie, N. Y.: Sealed proposals will be received at the office of the Water Board of the City of Poughkeepsie, N. Y., until noon of Friday, November 28, 1890, for furnishing and laying about 2,200 feet of 24-inch vitrified sewer pipe, with manholes and silt basins. Plans may be seen, and specifications and forms of proposal obtained at the said office. Chas. E. Fowler, superintendent.—— Huntsville, Ala.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 29th day of November, 1890, for all the labor and material and fixing in place, complete the low-pressure, return circulation, steam heating and ventilating apparatus for the U. S. court-house, post-office etc., building at Huntsville, Alabama. Jas. H.Windrim, Supervising Architect.——Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect of the Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 3d day of December, 1890, for all the labor and materials required to put in place, complete the iron vault and closet doors for the U. S. Court-House and Post-Office building at Pittsburg, Pa. Jas. Windrim, Supervising Architect. ——Houston, Tex.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 29th day of November, 1890, for all the labor and materials and fixing in place, complete the low-pressure, steam heating and ventilating apparatus, for the U. S. Post-Office, etc., building at Houston, Tex., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Houston, Texas. Jas. H. Windrim, Supervising Architect.——Victoria, B. C.: Tenders will be received up to 4 o'clock P. M. on the 17th of December next, at the office of the undersigned, for the construction of sewers for the corporation of the city of Victoria, B. C. For particulars of plans and specifications apply at the city hall, Victoria, on or after the 15th day of November next ensuing. Estimated cost of sewers, $300,000. Wellington J. Dowler.—— Rockford, Ia.: Proposals are wanted for the construction of a complete system of water-works. Address Mayor C. Yorker, for particulars.——Canton, S. D.: Proposals are wanted until December 1st for the construction of a system of water-works. Address A. A. Richardson, C. E., Lincoln, Neb.——Arkadelphia, Ark.: Proposals are wanted for the construction of a system of water-works. Address G. W. Carder, Architect.——Rockford, Ill.: Proposals are wanted until November 29th, for the construction of certain sewers. Address E. K. Conkling, City Clerk.——Toronto, Ont.: Proposals are wanted until December 3rd, for furnishing a vertical pumping engine. Address J. D. Cook, Consulting Engineer, Toledo, O.——Harrison O.: Proposals are wanted until December 2nd for the construction of an electric light plant. Address Mayor J. A. Graft.

STRENGTH OF LEAD PIPE.

Lead pipe will sustain quite a heavy pressure if it is applied without shock, but in all practical work, in the plumbing of houses especially, the column of descending water suddenly stopped by the closing of a faucet, exerts an increased pressure that will burst pipes which would stand a very much larger weight of still water. If the safe working pressures given in the table referred to were only slightly in error, I would not think it necessary to call your attention to them; but my practical experience has shown that the figures there represented are very far from consistent with safe practice. Perhaps the best evidence to present in support of my views, are instances that occurred in practical work. When aerated bread was first made in this city, we were asked to furnish a tin-lined lead pipe under two inches in diameter to stand the pressure of 140 pounds to the square inch, the pipe to be used for conveying the carbonic acid gas, which was forced through the dough after it was mixed. We furnished for the purpose AAA pipe, but it would not stand the pressure. We then made for them a heavier pipe, but with no better results. Finally, we made a pipe that was at least three times as strong as AAA pipe, but even this did not stand the 140 pounds pressure. Of course, these pipes did not give out at once, and the strongest lasted a few weeks, but eventually the lead swelled and burst. The parties for whom we furnished the pipe were finally obliged to use an iron pipe, tin-lined, the tin being necessary to prevent the corrision of the iron by the carbonic acid gas. You will notice that the pressure was only 140 pounds to the square inch, and according to the table you printed, "safe working pressure" of all the AAA pipes under three inches was considerably in excess of this figure.—*Master Steam Fitter.*

SCHOOLS AND THE SPREAD OF DISEASE.

It is the power of each member of the general public to assist in some way or other the efforts of the sanitary officers to promote good sanitation and prevent the spread of infectious disorders, and in every rightly ordered community such co-operation and mutual confidence is encouraged and fostered with beneficial results. Especially it is in the power of those engaged in education thus to co-operate in sanitary work. Take the records of epidemic of measles as an example. Health authorities can do little to combat this disease. The infection exists and is spreading abroad before the disease declares itself by the appearance of a rash. "It is by school managers and those interested in education," remarks Dr. Barwise, in his last report on the health of Blackburn, "insisting on children with indications of feverishness, suffusion of the face, watering of the eyes, and other premonitory signs of measles, remaining at home for two or three days until these symptoms have passed away, or the disease has become apparent, that we must look for a reduction in the death-rate from measles. No child coming from an infected house should be allowed to return to school for four weeks. While I am speaking of the influence of schools on the propagation of infectious diseases, I might say that I believe that with a little practice, a clinical thermometer in the hands of the superintendent of each school would frequently lead to the discovery of zymotic disease, which might otherwise remain undetected until a number had become infected. Again, each morning might be started by a show of hands, and a brief examination of each pupil, more care being taken with those who had recently been absent from school. Any child whose hands were peeling, or shedding scales, should be sent home as being still in a position to spread infection. School teachers could very easily obtain a knowledge of the early symptoms of fevers, and such knowledge would prove a protection to themselves and an advantage to their schools."

A CHANCE TO MAKE MONEY.

I bought one of Griffith's machines for plating with gold, silver or nickel, and it works to perfection. No sooner did people hear of it than I had more spoons, knives, forks and jewelry than I could plate in a month. The first week I cleared $31.30, the first month $167 85, and I think by July first I will have $1,000 cash, and give my farm considerable attention, too. My daughter made $27.40 in four days. Any person can get one of these machines by sending $3 to W. H. Griffith & Co., Zanesville, Ohio, or can obtain circulars by addressing them. You can learn to use the machine in one hour. As this is my first lucky streak, I give my experience, hoping others may be benefited as much as I have been.

Yours truly, M. O. Morehead.

BRAINS IN BUSINESS.

A writer in *The Office* says: One great secret of success in business—the secret, in fact, of success on a large scale—is to conceive of it as a matter of principles, not merely as a series of transactions. There are great merchants as there are great statesmen, and there are small merchants as there are small politicians, and the difference between the great and small men is very much the same in both. The small politician works by the day, and sees only one opportunity before him; the small merchant does the same thing—he is looking for the next dollar. The statesman, on the other hand, is master of the situation because he understands the general principles which control events; this knowledge enables him to deal with large questions and to shape the future.

The great merchant does the same thing. His business is not a mere money-getting affair, not a mere matter of barter, but a science and an art; he studies the general laws of trade, watches the general condition of the country, investigates present needs, foresees future wants, and adapts his business to the broad conditions of his time and place. He puts as much brains into his work as does the statesman, and he ends by being not a money-getter, but a large-minded and capable man.

An eminent successful man of the statesmanlike quality said the other day that the more he understood of life, the more clearly he saw that it was all done on business principles; by which he meant not only that the universe is governed by unvarying laws, but that promptness, exactness, thoroughness and honesty are wrought in every fiber.

On these business principles all life is conductad—if not by men, at least by that Power which is behind man. It ought to be the ambition of every young man to treat his business from the point of view of the statesman, and not from that of the politician.

ODD FELLOWS' CONVENTION AT SPRINGFIELD.

On account of the next session of the Grand Lodge, I. O. O. F., to be held at Springfield, Nov. 18-21, the Wabash Railroad will sell tickets to Springfield and return at half rates, November 17, 18 and 19, good returning November 24. Free chair-cars on all trains. Elegant sleepers on night trains. Office, 201 Clark St.

Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

HOSPITAL REMEDIES.

A NEW METHOD OF TREATING DISEASES.

What are they? There is a new departure in the treatment of disease. It consists in the collection of the specifics used by noted specialists of Europe and America, and bringing them within the reach of all. For instance the treatment pursued by special physicans who treat indigestion, stomach and liver troubles only, was obtained and prepared. The treatment of other physicians, celebrated for curing catarrh was procured and so on till these incomparable cures now include disease of the lungs, kidneys, female weakness, rheumatism, and nervous debility. The new method of "one remedy for one disease" must appeal to the common sense of all sufferers, many of whom have experienced the ill effects, and thoroughly realize the absurdity of the claims of Patent Medicines which are guaranteed to cure every ill out of a single bottle, and the use of which, as statistics prove, *has ruined more stomachs than alcohol.* A circular describing these new remedies is sent free on receipt of stamp to pay postage by Hospital Remedy Company, Toronto, Canada, sole proprietors.

BURLINGTON ROUTE—BUT ONE NIGHT TO DENVER.

"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

THE ONLY ONE.

The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Milwaukee, St. Paul and Minneapolis.

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THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

PLUMBERS' SUPPLIES.

The Whittaker Supply Co., 151 W. Washington street.

SEWER BUILDERS.

Dee, Wm. E., 154 La Salle street.
Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Boyd, T. C., 42 Dearborn street.
Breyer, E., 72 W. Randolph street.
Breyer, C., 833 Milwaukee avenue.
Canty, John, 3105 State street.
Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Klein, Stephen, 712 and 714 Milwaukee avenue,
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street,
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Probasco, R. P., 36 and 38 Dearborn street.
Reilly, Joseph & Bro., 517 W. Madison street.
Roche, J. H., 208 Thirty first street.
Roughan, M. J., 25 Quincy street.
Ruh, Valentine, 548 Wells street.
Sanders, P. & Son, 505 State street.
Schmidt, Ira T., 145 Michigan street.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

HELP WANTED.

Our readers are cordially invited to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of The Sanitary News, *88 and 90 La Salle Street, Chicago.*

WANTED.—FIRST-CLASS PLUMBERS. None but competent men need apply. No fares paid. W. H. S., 1212 Douglas St., Omaha, Neb.

WANTED.—A FIRST-CLASS BRASS FINisher, one able to handle men, to take charge of our brass finishing department. Ette & Henger Mfg. Co., St. Louis, Mo.

WANTED.—A FIRST-CLASS GAS FIXTURE man who can also do gas fitting. Address, W. H. Spelman, 1212 Douglas St., Omaha, Nebraska.

WANTED.—SUPERINTENDENT FOR CHIcago Branch by manufacturers of a specialty in the Plumbers' line. Applicant must have had several years' experience among Chicago Plumbers, Builders and Architects. Thoroughly acquainted with credits, and come highly recommended for integrity, push and executive ability. Good pay to the right man. Address, "G. W. B.," care of The Sanitary News.

SITUATIONS WANTED.

Persons desirous of securing situations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of The Sanitary News, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN, 20 years of age, as salesman for a wholesale plumbing house, or to sell some specialty in the plumbing line. Has had four years experience with plumbing goods. Address "Sales," care The Sanitary News.

SITUATION WANTED.—BY A HUSTLER, 22 years of age, six years' experience in the Plumbing, Gas and Steam Supply business, as city solicitor for some A1 Supply house. Would take position in house for a while to show that I am well qualified. Address, "C. A. C.," care of The Sanitary News.

SITUATION WANTED.—BY A THOROUGHLY competent heating engineer. Can do anything from soliciting to practically doing work. Location no object. Address, "H. E.," THE SANITARY NEWS.

SITUATION WANTED.—BY YOUNG MAN AS collector for some plumbing house. Can furnish bond and first-class references. Address "L," THE SANITARY NEWS.

SITUATION WANTED.—AS A SALESMAN by a young man who has had ten years' experience with one of the largest plumbing supply houses in the West. Best of references furnished. Address, "W. F. E." care of THE SANITARY NEWS.

SITUATION WANTED.—BY A FIRST-CLASS plumber in some Western city. Address, "Tiffany," care of THE SANITARY NEWS.

SITUATION WANTED.—AS FOREMAN BY A practical plumber; can estimate from plans and is competent to take charge of entire business. Address, "Plumber," 1221 Wesley Ave., Columbus, Ohio.

SITUATION WANTED.—BY A YOUNG MAN, who has had seven years' experience in the Plumbing, Steam and Gas Fitting supply business, as traveling salesman. Is well acquainted with trade in Virginia, North and South Carolinas, Georgia and Alabama. Can furnish good references. Address, "Supply," care of THE SANITARY NEWS.

SITUATION WANTED.—AS TRAVELING salesman in Plumbing, Gas and Steamfitters' Supplies. Fifteen years' experience. 35 years old. Strictly temperate. Acquainted with the trade in New York, Pennsylvania, New Jersey, Michigan, and Indiana. E. D. O'BRIEN, 42 So. Division St., Buffalo, N. Y.

PROFESSIONAL.

HENRY ROBERT ALLEN, MEM. SAN. INST. Surveyor, 50 Finsbury Square, and 319 Victoria Park Road, South Hackney, E. London, inspects houses and furnishes reports of their sanitary condition. Terms moderate. References. London agent for THE SANITARY NEWS, published at 88 and 90 La-Salle street, Chicago, Ill., U. S. A. Money orders and checks should be made payable to THE SANITARY NEWS.

RUDOLPH HERING,

Mem. Am. Soc. C. E., M. Inst. C. E.

Civil and Sanitary Engineer

277 Pearl St., near Fulton, New York.

Designs for Water Supply and Sewerage. Construction Superintended.

GEO. E. WARING, JR., M. INST. C. E.

Consulting Engineer for Sanitary and Agricultural Drainage and Municipal Work.

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WARING, CHAPMAN & FARQUHAR,

CIVIL ENGINEERS, Newport, R. I.

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WM. PAUL GERHARD, CIVIL ENGINEER, author of "House Drainage and Sanitary Plumbing," "Guide to Sanitary House Inspection," etc., offers advice and superintendence in works of sewerage, water supply, ventilation, and sanitation. Sanitary arrangement of Plumbing a Specialty. Work in Chicago and the West particularly desired. Correspondence solicited. 39 Union Square, West, New York City.

PLUMBERS' CARDS.

DAVID WHITEFORD, PRACTICAL PLUMBER and Gas-fitter. Sanitary plumbing a specialty. 372 W. Randolph Street, Chicago, Ill.

P. HARVEY, SCIENTIFIC AND PRACTICAL Plumber, 540 Thirty-Ninth Street, between Michigan and Indiana Avenues, Chicago. Residence, 3629 Dearborn Street.

SEALED PROPOSALS.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 29th day of November, 1890, for all the labor and materials, and fixing in place complete, the low-pressure, steam heating and ventilating apparatus for the United States Post Office, etc., building at Houston, Texas, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Houston, Texas. Each bid must be accompanied by a certified check for $100.00, The Department will reject all bids received after the time herein stated for opening the same; also all bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in an envelope sealed and marked "Proposal for the Low-Pressure, Steam Heating and Ventilating Apparatus, for the United States Post Office, etc., Building at HOUSTON, TEXAS," and addressed to

JAS. H. WINDRIM,
November 10th, 1890. Supervising Architect.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 29th day of November, 1890, for all the labor and material, and fixing in place complete, the low pressure, return circulation, steam heating and ventilating apparatus, for the U. S. Court House, Post Office, etc., building at HUNTSVILLE, ALABAMA, in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Custodian at Huntsville, Alabama. Each bid must be accompanied by a certified check for $100.00. The Department will reject all bids received after the time herein stated for opening the same; also bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Low Pressure, Return Circulation, Steam Heating and Ventilating Apparatus, for the U. S. Court House, Post Office, etc., Building at Huntsville, Ala.," and addressed to

JAS. H. WINDRIM,
November 11th, 1890. Supervising Architect.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 9th day of December, 1890, for all the labor and material, and fixing in place complete, the low pressure, return circulation, steam heating and ventilating apparatus for the United States Court House, Post Office, etc., building at Augusta, Georgia, in accordance with the drawings and specifications, copies of which may be had on application at this office, or at the office of the Superintendent at Augusta, Georgia. Each bid must be accompanied by a certified check for $100.00. The Department will reject all bids received after the time herein stated for opening the same; also bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in envelopes, sealed and marked "Proposals for the Low Pressure, Return Circulation, Steam Heating and Ventilating Apparatus for the U. S. Court House, Post Office, etc., Building at Augusta, Georgia," and addressed to

JAS. H. WINDRIM,
November 17, 1890. Supervising Architect.

BUILDING PERMITS.

G. C. Watts, 3 and 2-sty and bst brk dwllg, 20x35x40, 20x35x30, 4425 Ellis ave; a, W. D. Cales	$15,000
L. C. Lawton, 2-sty and bst brk dwllg and brn, 33x24, 62x40, 4436 Greenwood ave; a, Flanders & Co	14,000
Miller & Chamberlin, 4-sty and cel brk flts, 24x70, 4225 Berkley st; a, Flanders & Co	15,000
Miller & Chamberlin, 4-sty and cel brk flts, 24x70, 4228 Greenwood ave; a, Flanders & Co	15,000
Jno. R. Towle, 6 4-sty and cel brk flts, 150x70, 390-400 63rd street; a, Flanders & Co	50,000
W. H. Berger, 4 2-sty and cel brk dwllgs, 62x64, 3811-17 Langley ave; a, W. H. Berger	8,000
F. M. Williams, 1-sty brk addn, 125x86, 174-88 Monroe st; a, Thomas & Rapp	8,000
Jno. A. Pahge, 2-sty bst and att brk dwllg, 26x60, 516 Ashland ave; a, F. Alhlacheger	8,000
A. Park, 6 3-sty and bst brk strs and flts, 50x124, 117-19 Laughton st; a, C. J. Ohman	30,000
Albert Grise, 3-sty and bst brk strs and flts, 25x80, 778 W. Division st; a, Worthman & Neebe	8,000
L. P. Kadish, 4 and 3-sty and cel brk strs and flts, 46x90, 100x185, 2321-29 Wabash ave; a, Furst & Rudolph	75,000
Christian Hummell, 24-sty and bst brk strs and flts, 40x70, 25-27 Austin ave; a, Fromman & Jobson	8,000
L. P. Schafer, 2 3-sty and cel brk flts, 50x60, 1047-49 N. Clark st; a, Theo. Karls	15,000
S. Roth, 4 2-sty brk flts, 20x40, 71-77 Davlin ave	12,000
Bullock Bros., 2 2-sty brk strs and flts, 50x65, 25-27 W. 48th st	6,000
F. Grimsel, 2-sty and bst brk str, 60x70, 78-82 W. Erie st; a, Henry Kley	8,000
Theo. Sodemann, 3-sty and cel brk flts, 25x85, 537 Larrabee st; a, Reight & Knorr	8,000
West Chicago Street Railroad Company, 1-sty brk addn, 142x194, 578-90 Western ave	10,000
John A. Brown, 4 4-sty and bst brk flts, 75x82, 3125-31 Greenwood ave; a, O. M. Amquist,	20,000
M. V. Tremaine, 2 2-sty and cel brk flts, 44x60, 1229-31 W. Adams st	11,000
Mrs. M. Gage, 3-sty and cel brk flts, 22x65, 1079 Warren ave; a, O. J. Pierce	10,000
E. J. Lewis, 4 3-sty brk strs and flts, 129x53 273-81 Ogden ave; a, De LaPointe	21,000
Charles Vietyer, 3-sty and cel brk flts, 22x72, 1344 Lexington st; a, Ruhl & Huldom	7,000
Mrs. Mary Shehan, 3-sty brk str and flts, 25x52 1337 W. Harrison st; a, A. G. Bowdry	8,200
M. L. Teimann, 2 3-sty and cel brk flts, 50x65, 779 W. Polk st; a, Sever & Schultz	12,000
Jno. Richak, 4-sty and cel brk str and flts, 25x80, 609 Blue Island ave; a, Ruehl & Hildinger	8,000
Mrs. Emma Dreesbach, 3-sty and bst brk flts, 22x67, 631 Fullerton ave; a, J. F. and J. P. Doerr	6,000
Chas. Sternbrecher, 16 2-sty and cel brk flts and dwllgs, 336x43, 1012 54 W. Superior st; a, Julius Huber	65,000
Michael Walsh, 3 and 2-sty and bst brk dwllgs and flts, 28x26, 36x54, 447 Hermitage ave; a, H. Olszwiski	7,000
K. Frederick, 3-sty and bst brk str and dwllg, 24x84, 190 W. Clyborn Place; a, R. Vorte	5,000
H. L. Birch, 3-sty and bst brk frnt addn, 22x23, 1920 Michigan ave; a, H. Cabo	7,000
Wm. Shaughnessy, 2-sty and bst brk flts, 25x70, 445 Hermitage ave; a, N. S. Devine	6,500
Albert Koch, 2-sty and cel brk flts, 22x52, 487 Walnut st; a, Lampson	5,000
Edward E. Ederer, 2-sty and bst brk dwllg, 24x48, 1733 Roscoe st	5,000
E. Anderson, 3-sty and cel brk str and flts, 24x75, 5119 Wentworth ave	7,000
F. G. Barkley, 2-sty and cel brk dwllg, 22x50, Harvard and 64th sts; a, Bell & Swift	5,000
Timothy Bergan, 3-sty and bst brk strs and flts, 24x74, 2631 S. Halsted st; a, P. O Shey	5,000
Christian Barn, 2-sty and bst brk str and flts, 24x70, 81 W. 13th street	5,000
Henry Holy, 3-sty and bst brk flts, 24x66, 497 N. Ashland ave	5,000

Scribner's Magazine,

For the coming year will be noteworthy for a number of special features which the Publishers believe are of very unusual interest, and among them the following may be mentioned:—

Sir Edwin Arnold

contributes to the December number the first of a series of four *Articles upon Japan*, its people, its ways, and its thoughts. Mr. Robert Blum, who was commissioned to go to Japan for Scribner's Magazine, has prepared a very remarkable series of drawings to illustrate Sir Edwin's papers. Articles upon the recent *Japanese Festival* will follow, illustrated by Mr. Blum.

Henry M. Stanley

has prepared for the January number an important article upon "*The Pigmies of the Great African Forest.*" Another contribution in this field will be Mr. J. Scott Keltie's account of the recent *African Exhibition* held in London. Both papers will be amply illustrated.

The Wrecker,

a Serial Novel by Robert Louis Stevenson and Lloyd Osbourne, will run through a large part of the year. Illustrated by Hole. A two-part story by Frank R. Stockton will also appear.

Prof. James Bryce, M. P.,

author of "The American Commonwealth," will write a series of *Four Articles upon India*, embodying the results of his recent journey and studies on this land of never-ending interest.

Ocean Steamships

will be the subject of an important series somewhat upon the lines of the successful Railroad Articles. "*Passenger Travel*," "*The Life of Officers and Men*," "*Speed and Safety Devices*," "*Management*," are some of the subjects touched upon and illustrated.

Great Streets of the World

is the title of a novel collection of articles on which the author and artist will collaborate to give the characteristics of famous thoroughfares. The first, on *Broadway*, will be written by Richard Harding Davis, and illustrated by Arthur B. Frost. Others will follow on *Piccadilly*, London; *Boulevard*, Paris; *The Corso*, Rome.

The price of Scribner's Magazine admits of adding a subscription to one's other reading at very small cost. Orders should be sent at once.

$3.00 A YEAR. 25 CENTS A NUMBER.

Charles Scribner's Sons, Publishers,

743-745 Broadway, New York.

A GREAT AMERICAN MAGAZINE.

THE SUCCESS OF "THE CENTURY" AND ITS PLANS FOR 1891.

THE CENTURY MAGAZINE is now so well-known that to tell of its past success seems almost an old story. The N. Y. *Tribune* has said that it and its companion, *St. Nicholas for Young Folks*, issued by the same house, "are read by every one person in thirty of the country's population,"—and large editions of both are sent beyond the seas. It is an interesting fact that a few years ago it was found that seven thousand copies of *The Century* went to Scotland,—quite a respectable edition in itself. The question in England is no longer "Who reads an American book?" but "Who does not see the American magazines?"

A few years ago *The Century* about doubled its circulation with the famous War Papers, by General Grant and others, adding many more readers later with the Lincoln History and Kennan's thrilling articles on the Siberian Exile System. One great feature of 1891 is to be

"THE GOLD HUNTERS OF CALIFORNIA,"

describing that remarkable movement to the gold fields in '49, in a series of richly illustrated articles *written by survivors*, including the narratives of men who went to California by the different routes, accounts of the gold discoveries, life in the mines, the work of the vigilance committees (by the chairman of the committees) etc., etc. General Fremont's last writing was done for this series. In November appears the opening article, "The First Emigrant Train to California,"—crossing the Rockies in 1841,—by General Bidwell, a pioneer of pioneers. Thousands of American families who had some relative or friend among "the Argonauts of '49" will be interested in these papers.

MANY OTHER GOOD THINGS ARE COMING,

the narrative of an American's travels through that unknown land Tibet (for 700 miles over ground never before trod by a white man); the experiences of escaping War Prisoners; American Newspapers described by well-known journalists; accounts of the great Indian Fighters, Custer and others; personal anecdotes of Lincoln, by his private secretaries; "The Faith Doctor," a novel by Edward Eggleston, with a wonderfully rich programme of novelettes and stories by most of the leading writers, etc., etc.

It is also announced that *The Century* has purchased the right to print, before its appearance in France or any other country, extracts from advance sheets of the famous Talleyrand Memoirs, which have been secretly preserved for half a century—to be first given to the world through the pages of an American magazine. All Europe is eagerly awaiting the publication of this personal history of Talleyrand—greatest of intriguers and diplomats.

The November *Century* begins the volume, and new subscribers should commence with that issue. The subscription price ($4.00) may be remitted directly to the publishers, The Century Co., 33 East 17th St., New York, or single copies may be purchased of any newsdealer. The publishers offer to send a free sample copy—a recent back number—to any one desiring it.

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—AT—

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SUBSCRIPTION RATES.

The subscription price of THE SANITARY NEWS, in the United States, Canada and Mexico is $2.00 a year, payable strictly in advance; foreign, 12s. 6d. a year. The number with which the subscription expires is on the Address-Label of each paper, the change of which to a subsequent number becomes a receipt for remittance. When a change of address is desired, the old address should accompany the new.

ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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RECENT statistics relative to the death rate in European armies in time of peace, place that of the Spanish army at 13 per 1,000. Russia comes next with one of 9, then Italy with one of 7.74. Next in order comes Austria with a mortality of, in round numbers, 7 in the thousand, France with 6, England with a little over 5, Belgium with a little over 4, and Germany with a little over 4. Consumption is rifest among English soldiers, and least prevalent among the French.

ABOUT two thousand physicians are said to have gone to Berlin to study under Prof. Koch.

DR. HOBRECHT, in speaking of the effect of the sewerage system of Berlin on the health of the city, says: "It is certain, and has been officially stated, that infectious diseases, especially typhoid fever, have decreased; it is probable, however, that in the present state of science no one is able to maintain that this is due to the sewerage system, while the time since the completion of the works has been too short to admit of an empirical inference in this direction. Hygiene, on the other hand, adheres to the principle that it is of importance to promote cleanliness in water, air and soil. The sewerage system of Berlin has satisfied this demand in a degree partly attained in some other cities, wholly in none. No other city, however, of more than a million inhabitants can boast of the achievement that the water of the river that flows through it, especially if so small as the Spree, is clean, and that the same may be said of the water of the main ditch, which, after the removal of the suspended and dissolved impurities by irrigation and drainage, carries off the waste water of nearly half a million people."

THERE was not a single death from small-pox registered in Ireland last year.

IN competitive bids for a contract for plumbing work, the lowest bidder, when comparatively extremely low, may be looked on with some suspicion.

DURING the last decade the plumbing fraternity has been an active and important agency in the advancement of sanitary science, and has strong claims to prominent recognition among the foremost forces to which its rapid progress is due.

EXPERIENCE has taught that the cheapest is not the best, but that the best is the cheapest, although costing more originally. This with regard to plumbing is an important matter, as the best means of preserving health is the cheapest, from every point of view.

THE sanitary value of slack-water navigation is discussed by J. M. Sanford in the *Bulletin* of the Tennessee State Board of Health, in which it is observed that slack-waters form a series of pools in the course of a stream. The water is not stagnant, as in a pond, but the flow is regulated by the supply—the level remaining near the same point at all times. By this means the uncovering of areas usually under water, and the occasional flooding of low lands usually dry, are in some measure prevented. Low, marshy spots near the stream are also covered, and from all these it results that the most fruitful sources of malaria are shut off. If the water be used for drinking purposes, the slack-waters act as subsiding reservoirs; and as fresh-water plants grow more luxuriantly in them than in the shallow and rapid current of the natural channel, the water is purified by the action of both these agencies. Flushing is accomplished by heavy rains and by the spring freshets. Analysis of the river and well waters at Zanesville, by Dr. Culbertson, showed that the river-water was beyond comparison the purest; and the same writer states that the death-rate from malaria, pneumonia and diarrhœa is now less than it was in 1869. Along the Shenango Valley the abandonment of the Erie Canal and letting out of the slack-waters has resulted in a widespread prevalence of malaria, which has not disappeared after ten years, though the type of disease has been somewhat modified. Here, low tracts were uncovered which had for many years been under water, accumulating mud, laden with organic matter in abundance. The river-water was not used for drinking, and the ague arose from emanations from the soil.

NOTES AND NEWS.

The largest dwelling-house in the world is in Vienna, and 2,112 people live in it.

A plumber in England won the university prize for an essay on English poetry.

According to the *American Art Printer*, there are 135,000 printers in the United States.

Epidemics, such as influenza, are said to arise when the supply of ozone in the air is insufficient.

A glass manufacturer has succeeded in producing glass plates of great breadth and any desired length, by means of rolling.

There are 445 complete rolling-mills and steel-works in the United States, and eleven buildings.

M. Laborde, of the Paris faculty, announced his discovery of a new anæsthetic, which he calls crystallized narcein.

In spite of all efforts, fevers are rapidly spreading in London.

Nearly 14,000 horses are annually consumed as food in Paris. In Vienna and Berlin the annual consumption is about 6,000 horses each.

Black Sea soundings are said to show that below the depth of 600 feet the water is so impregnated with sulphurated hydrogen gas, emanating from decaying animal and vegetable matter, that living organisms are not found there.

It is not generally known that ink-stains can readily be removed from the fingers with the head of a parlor match. Moisten the ink-stained spot and rub it gently with the head of the match, keeping the skin wet so that it will not be burned.

The Colorado State Board of Health, after July 1, 1893, will not accept the diplomas of any school which does not have an obligatory three-years' course of instruction of five months each, in three different years.

To detect fecal matter in drinking-water, Griess recommends a feebly alkaline solution of para-diazo-benzol-sulphuric acid, which, with water contaminated as indicated, will produce a yellow discoloration within five minutes.

In England and Wales, out of 26,954 food samples which were recently analyzed, 3,096 were found to be adulterated. This is equal to 11½ per cent.—a percentage lower than in any previous year since 1888, when it was under 11.

The soundness of timber may be ascertained by placing the ear close to one end of the log, while another person delivers a succession of smart blows with a hammer upon the opposite end, when a continuance of the vibrations will indicate to an experienced ear even the degree of soundness. If only a dull thud meet the ear, the listener may be certain that unsoundness exists.

A portion of the Boulevard Anspach, Brussels, is being laid with a new paving called "caoutchouc macadam." It is a mixture of India-rubber and certain stones ground together and converted into a soft paste by heat. The new material is not slippery, and is said to withstand the heat of summer or the cold of winter, while being very durable.

The most recent observations as to the amount of heat the earth receives from the sun show that in clear, pleasant weather 63½ per cent. of heat is absorbed by the atmosphere, and only 36½ per cent. reaches the soil. This figure rises in October to 41 per cent., and sinks to 28 per cent. in January.

The Mexican onyx-stone is worked in a peculiar manner. Deep, round holes are drilled by hand in a line. In each hole is inserted a snugly-fitting piece of wood, which has been grooved from end to end. Hot water is poured into the grooves at night. This swells the wood, and the block is split along the line without damage. The natives then saw the blocks into slabs and polish the surface by hand. Each piece is semi-transparent, and when placed between the eye and a strong light presents a remarkably beautiful effect in form and color.

M. G. Alessi has confirmed and extended the results of Grassi on the part taken by flies in the propagation of disease. Having fed flies on the matter expectorated by tubercular patients, he has detected the bacillus of tuberculosis in plenty of the intestines and in the excretions of the insects. The bacilli are alive and active, and if introduced into the tissues of animals, they multiply and produce characteristic lesions. The microbia of cholera, of typhoid fever, splenic fever, etc., are likewise swallowed by flies, and, after passing through their bodies, retain their vitality and virulence.—*Research.*

An electrician the other day said: "A simple and almost perfect method for purifying the atmosphere of crowded apartments, such, for instance, as railway cars, is to produce ozone by electrical sparks, and the practice has been strongly recommended by the highest medical authorities. The delightful freshness and vigor which is perceptible in the air after a series of sparks from an ordinary influence machine is a proof of the salutary and refreshing influence produced."

It is not generally known that Mr. C. P. Huntington, the Pacific millionaire, commenced gathering his great fortune by picking up a one-penny nail whenever he saw one on the floor. He did not delay exerting himself until he had come across a ten-penny nail or a wire nail, but took what was lying around, however small. Thus we see that if a man picks up enough one-penny nails and a few government subsidies, he may ultimately connect his family with the effete monarchies of Europe, and rise to the exalted position of father-in-law of an impecunous prince. The nail market is a great factor in life.—*Stove and Hardware Reporter.*

Dr. Ollivier has recently reported a case of contagious tuberculosis at Neuilly. A family of seven occupied a house in the Rue du Pont. In the course of two years five out of the seven were attacked with tuberculosis; two are dead and three are seriously ill. Inquiry showed that the house had formerly been occupied by a family suffering from tuberculosis; in 1887 a child died in it from that disease. It is supposed that this case, which was the first, is the origin of the contamination. Dr. Ollivier concludes from this, and the other cases brought under his notice, that it is dangerous to inhabit a house which has been previously inhabited by tuberculous patients, unless it be thoroughly disinfected. The paper should be stripped off, and the walls whitened with lime; the wainscotting and floor should be scraped and washed with a one in 1,000 solution of corrosive sublimate.

The talent of success is nothing more than doing what you can do well, and doing well whatever you do without a thought of fame. If it comes at all, it will come because it is deserved, not because it is sought after.—*Longfellow.*

Good Health has made an analysis of a cigarette. The tobacco was found to bə strongly impregnated with opium, while the wrapper, which was warranted to be rice-paper, was proved to be the most ordinary quality of paper whitened with arsenic. The two poisons combined were present in sufficient qnantities to create in the smoker a habit of using opium without his being aware of it, his craving for which can only be satisfied by an incessant consumption of cigarettes.

WATER-WORKS AND SEWERAGE FOR SMALL TOWNS AND CITIES.*

The apparent magnitude of the task of building sewers and water-works and the necessary co-operation of a majority, both in numbers and wealth, of the citizens, seem to be the hold-back or reverse-lever which retards the growth of many otherwise promising villages, and lessens their advantages as places of business and residence. At the request of my friend, the president of the Agricultural Insurance Company of Watertown, N. Y., I write this article for the purpose of presenting a few reasons why, even in small towns and villages, water-works and sewerage are very desirable, and why, also, they are true economy. I shall also give some data bearing on the requisites and the cost of efficient water and sewerage works in such towns. I hope to divest the undertaking of its apparent magnitude, and to show that the cost is not excessive, and that the best economy, even in the smallest villages, always leads to an efficient system of both water and sewerage.

Whenever, for the purpose of trade, manufacture or convenient residence, masses of human beings congregate in small towns, villages or hamlets, an artificial existence, to some extent, is inaugurated. Each individual is no longer a law unto himself; neither can each family be henceforth a law unto itself. The habits and environments of those surrounding the individual or family must necessarily influence his or its position. The preservation of the health of the neighborhood is important not only to one, but to all; to the rich and to the poor. The poor man's health is his wealth, and the wealth and riches even of a Crœsus will not stop the ravages of an infectious disease when it once obtains a foothold; and disease itself is no respector of persons. It may be that a single infected person will, under bad sanitary surroundings, bring infection to an entire neighborhood. So easily are the seeds of disease spread that it becomes only a matter of common prudence to strive to maintain the body in vigorous health by removing unsanitary conditions which tend to lower vital energy.

* By Stephen E. Babcock, civil and hydraulic engineer, chief engineer of water-works, Little Falls, N. Y. From *The Fireman's Manual*, published by the Agricultural Insurance Company.—*Fire and Water.*

Dr. Playfair well said in his Glasgow address in 1874: "Man has no control over a single natural force; the laws of health, like other laws of nature, are relentless in their severity. If you stand on the edge of a precipice and overbalance yourself, the law of gravity relentlessly pulls you down. Equally, without mercy, are you punished for the smallest infraction of the laws of health, whether you live in cities or in villages."

Napoleon, at St. Helena, said: "Life is a fortress which neither you nor I know anything about. Water, air and cleanliness are the chief articles in my pharmacopœia."

Yet pure water, pure air and cleanliness can hardly be preserved in any village or town for any great number of years without resort to a public water and sewerage system. In villages the out-door privy is universal; inside water-closets require both water-pressure and sewerage. In the summer months privies are a nuisance scarcely to be tolerated, while in wet weather and in winter their use involves an exposure that not all well persons are able to withstand. James C. Bayles says: "Women are special sufferers from this cause; hence we find that in wet and cold weather they defer their visits until compelled by unbearable physical discomfort to brave the dangers and annoyances of a dash out of doors. Physcians say that, even in cities, where provision is made for comfort and health, irregularity is the one fruitful cause of disease among women. What, then, can we expect in country villages, where a visit in a cold storm, or when snow covers the ground and the weather is bleak and frosty, must be attended by a physical shock which even strong men dread?

Again, at the back doors of farm and village homes we find another serious evil—either in a defective drain or in the absence of any drain at all. In the latter case, "the slops are commonly thrown on the ground and left to take care of themselves; the ground, instead of being soft and absorbent, becomes bare, hard, and is often covered with mould. To a person unaccustomed to it the smell is nauseating. If a drain is used at all it generally ends nowhere, and is often no more than ten or twelve feet long, a little pool at the end catching what passes through it. The miscellaneous refuse from the kitchen finds its way through it, and, together with the wash-water from the bedrooms and the chamber-lye, it must go through the usual process of decay in the drain or about its mouth. It is the rule, and not the exception, in most villages, that these conditions exist."

Let us now see whether good results have followed where water and sewerage have been introduced. It is a well-established fact, known especially among the medical fraternity, that since the introduction of public water-supplies and sewerage in cities, typhoid and other kindred fevers have been either prevented entirely or greatly reduced in number and virulence; and yet in unsanitary villages and in the country these zymotic diseases are still prevalent, even if they are not increasing. Bayles relates the case of a wealthy farmer in Orange county, N. Y., who experienced a terrible visitation of typhoid fever. The farm was one of the finest in that section, beautifully located, and to all appearances a sanitary paradise; and yet, when the affliction came, the cause of the disease was not difficult to find. It was a dairy farm, and it had been found easier to carry water to the dwelling than to the stock; therefore the well was located adjacent to the barn. Gradually but surely the water-supply was poisoned. The vital energies of the family lowered as the water deteriorated, and when the proper stage was reached the scourge knocked at the door of the farm-house, taking away the farmer's son in the prime of life, and leaving the father broken down in constitution and forever enfeebled by disease. All this was due to unsanitary surroundings in what should have been a residence absolutely proof against this class of disease.

The inquiry is a pertinent one as to how many dwellings in villages are in a similar situation, except that the slop-drain and the outside privy (instead of the stock-barn) exist near the well.

I therefore say that the construction of water-works and sewerage in small towns and villages, in their relation to health and comfort, is true economy. Baldwin Latham, the eminent English sanitary engineer, has exhaustively shown the savings from a sanitary standpoint, taking the case of the town of Coryden. Here the saving in life and sickness during twenty years, estimated at a low basis, was more than double the cost of an elaborate system of water and sewerage. It has been found from the statistics kept that the death-rate has been lowered from four to six persons in every thousand, where water and sewerage has been applied. That is, there are four to six unnecessary deaths to every thousand persons, and more than this; for every unnecessary death there had been twenty-eight to thirty-four cases of sickness, the average duration of the sickness being at least two weeks.

Now, assuming that each death and funeral costs the small sum of $25, and that each case of sickness involves a loss of, say, $10, then the actual cost of unsanitary surroundings during twenty years for each thousand persons I estimate as follows:

Say five deaths saved each year for twenty years equals 100 deaths at cost to each, $25	$ 2,500
Twenty-eight cases of sickness each year for twenty years, equals 560 cases at $10	5,600
Total cost of unsanitary conditions	$ 8,100

To which add two weeks' time of twenty-eight persons per year for twenty years, to say nothing of the time of nurses and friends devoted to the sick. Averaging the value of labor, skilled and unskilled, it is safe to say that $1 a day would be a low estimate. Twelve dollars a year for twenty-eight persons for twenty years would be $6,720. This added to the expenses of sickness and death makes a total of $14,280 in twenty years as the actual saving of dollars and cents, which a good system of water and sewerage would produce.

Then comes the further item, which is perhaps the largest item of all, the prolongation of the lives and the benefits to the health of the entire population of the town.

Add to this the saving in insurance premiums, and you have a total, even for a village of 1,000 inhabitants, of more than double the amount necessary to build a system of water and sewerage. Of course, this means that proper engineering skill shall be procured to prosecute the work in the best and most economical manner, and it is upon the theory that the water and sewerage shall be provided at one and the same time.

This leads to the consideration of the question whether water-pipes and sewers can be laid at the same time, in the same trench, and one excavation saved. Sewers are, of necessity, laid to a fixed grade or incline, in order that the sewerage may be readily discharged. The sewer must be placed at a depth to drain all the cellars. This necessitates starting the upper end, or beginning, at about seven feet depth. Water-pipes only require to be five feet deep, and when under pressure do not require to follow any grade, but may be laid up hill and down, following the contour of the ground. Water-pipes are always tapped on top of the main. It will be seen that this would require the sewer-pipe to be laid first, and at least two feet deeper than the water-pipe. After the sewer has been laid and filled up two feet or more, according to the grade, a bench is usually cut in one side of the ditch upon which to lay the water-pipe, and thus remove it above all possible contamination of the sewer. This course saves the main cost of sewerage—that is, the cost of trenching. Nearly one-half of the water-works system of Little Falls, N. Y., is laid in the same trench with the sewer-pipes, and with perfect success.

To provide water-works without sewerage is only going half-way, and to provide sewerage without water-supply is worse yet, as in this case there is no possible provision for removing the foul matter. Both should therefore be put in at the same time.

The above computation and argument is presented at this time as the strongest possible plea for the introduction of a water system in even the smaller hamlets and villages. Of course, the question of sewerage is not, perhaps, a pertinent one in an article which starts out simply in the interests of volunteer firemen and fire protection, but it is clear that no community would be willing to dissociate the question of a water-supply from the question of sewerage; and hence I have, as I believe, strengthened the position in favor of the firemen when I prove that in the matter of sewerage alone, and of the actual saving by sewerage alone, a water-supply is true economy wherever even a very few people are congregated.

Added to the figures given above will be the saving in insurance, which will also net a large sum in twenty years. Insurance companies seldom knowingly insure more than two-thirds or three-fourths actual values, and all loss in excess of this is a loss to the insured. Again, it is estimated that the relative values of a fire-risk stand in about these proportions:

Assume, if there is no water supply and no fire department, a standard rate of.....50 cents
If there is a fire department and no water supply, the rate would be, say.....45 cents
If a department and cistern supply, say.....40 cents
If a department and water supply other than gravity....30 cents
If a department and gravity water supply under fire pressure .....25 cents

This estimate will represent for a village of 1,000 persons a saving of at least 1,000 a year. This in twenty years would amount to $20,000. Add this to the sanitary savings as given above, and the total sum saved in twenty years is $34,820, which, as I show later in this article, will be largely in excess of the cost of works. These savings hold true even in the smaller villages, and they will always aggregate much more than the cost of water and sewerage, properly designed and executed.

[Concluded next week.]

MODIFICATION OF TUBERCULOSIS BY CLIMATE.*

There are many factors influencing the progress and termination of tuberculosis. A patient may improve or recover after making a change of climate who, had he remained in the locality where the disease first developed, might have gone steadily downward. The mechanical effects of barometric pressure do not furnish a satisfactory reason for the improvement.

It is probable that climates modify tuberculosis, not directly but indirectly; that is, through their influence upon microscopic life in general; that the reciprocal influences of living organisms, and consequently the conditions favoring or retarding the growth and propagation of microbes, furnish in any locality the most satisfactory explanation for the prevalence or absence of tuberculosis.

The experiments of Professor Charles Bouchard go far to demonstrate the proposition that in the case of tuberculosis and other infectious disease, the products, that is the secretions of the bacillus absorbed into the system, while not producing the disease itself, do produce in some way a diminished resistance to the disease. These experiments also furnish a plausable explanation of the way in which microbian products act. It was found that the walls of the blood vessels were constricted by the presence in the blood of these substances or by their contact with the vessels locally. The result was, however, much more marked when the products were introduced into the circulating blood.

As a rule we shall probably find that where microscopic life in its various forms flourish, there tuberculosis finds its most yielding victims; where microbic forms are at a minimum there tuberculosis is also at a minimum. On a clean ship in the wide sea, in the midst of a desert below sea level, on high arid plains, on mountain heights or beneath Arctic skies—wherever, in fact, the conditions favorable for bacterial growth are comparatively wanting,—there consumption is not frequent. It is certain that the forms or spores of the bacillus tuberculosis are carried to all these regions. They have their habitat in living organisms. This habitat is present, and is subject to attackas in the localities where consumption abounds, but in the absence of the products of other bacteria, diapedesis takes place, the leucocytes meet the invaders, and the disease-producing germs are destroyed.

By the use of disinfectants we are trying to accomplish in our crowded centers of population the death of the microbes and the sterilization of the soil in which they grow. With all our efforts, however, we cannot reach the measure of success already attained by nature in the terebinthinate forests, on the dry plains, on mountains, on the ocean away from the contaminating influences of decaying animal and vegetable substance.

(Dr. Johnson then presented to the association brief abstracts of twenty-five cases taken from his record books in the order of their entry. They embrace every case which, during about three years, from 1872 to 1875, went to the western states and territories, of which he was able to obtain any subsequent history.)

Of these twenty-five cases, ten recovered. Their histories cover from three to fifteen years, averaging eight years. Eight improved; six of them very much and two only slightly. Seven did not improve, but it is not certain that any were injured.

Some of the cases which improved returned east after a few months, when the disease again became active. In such cases a return to the arid regions did not seem to have the same influence in modifying its course as at the first visit. A large number of these patients were males.

(Of the cases reviewed by Dr. Johnson before the association, the patients who had followed his instructions and come to Colorado had, with one exception, been greatly benefitted or cured.) The exception was the case of a young man whose mother had died of consumption, and he had had hæmorrhages one year before consultation. He came to Colorado, but the disease had taken too strong a hold upon him and he received no benefit.

*Abstract of a paper read before the Denver meeting of the American Climatological Association by Dr. Johnson.—*American Lancet.*

PREVENTION OF WATER WASTE.

We have received No. 4 selected papers of the Civil Engineers' Club of the University of Illinois. The pamphlet contains fourteen papers on important topics from which we select the following, by C. J. Mitchell:

At the beginning of the Christian Era, Rome had, among other magnificent public works, a most lavish system of water supply. Nine large aqueducts, their massiveness concealed by a combination of architectural and engineering skill, conveyed to the city daily 365 gallons of water for each inhabitant, free and slave. The larger part of this enormous supply was used in the many public baths and imposing fountains. The gutters in the streets were streams of sparkling water. All the beautiful residences were connected with the public conduits, and the supply was paid for according to the size of the connection. In 67 A. D., Sextius Frontinous was water commissioner, and from his report we learn that here amidst this abundance of water, some penurious water-takers were cheating the meter by attaching diverging connections, and in this simple manner getting more water than they paid for. As a remedy Sextius suggested that the service pipe be made of uniform diameter for 50 feet from the connection, and that it be stamped with the inspector's seal.

None of our modern cities have as much water at their disposal as ancient Rome, and the wastage of water is a much more serious matter now than then. The European cities—Paris, Berlin, London and Liverpool, were the first to feel the effects of the wastage of their water supply. Many systems of detection and prevention have been suggested and tried, but the one that has proved the most efficient is that of house inspection. The officers visit the houses at unexpected times and examine the fixtures and plumbing. To discover large leaks, some inferential meter (similar to the one described at the end of this article) is placed in the mains.

In this country the question of water waste prevention has been considered by the water commissioners only within the last 10 or 15 years. But it has now, in our large cities, become a question of vital importance. The present water systems of many cities were laid out in times when the population was much more scattered and the amount used per capita much less than the present minimum allowance; and as a consequence a supply that was calculated to furnish abundance for 75,000 inhabitants, has failed to satisfy the demand of 40,000. This result is not entirely due to the fact that the people now use more water than they formerly did, but is largely on account of the amount wasted. The amount that is sufficient (including the water used in the manufacture and cooking of his food) is usually stated by authorities as 40 gallons per day per capita. The statistics for the year 1889 show that the average amount used in cities with over 10,000 inhabitants is about 60 gallons per day per capita.

In March, 1889, Detroit pumped daily 175 gallons for each inhabitant, and still the supply was not sufficient. Rochester, N. Y., and Harrisburg, Pa., found that increased pumping facilities made no perceptible decrease in the calls for more water, so they found it absolutely necessary to endeavor to check the enormous wastes. The amount of water wasted in Hoboken, N. J., was estimated by the engineer in charge to be about 30 per cent of the entire amount pumped. Other cities have placed their losses even as high as 50 per cent. Detroit in 1889 requested her citizens to be more economical in the use of city water, and as a result a decrease of three million gallons a day was observed. Harrisburg, Pa., placed 91 meters in places suspected of being sources of waste, and the reduction of one million gallons a day was the immediate result. The fact that large amounts are wasted is clearly shown

by the pump registers, the amount pumped during the night hours being nearly as great as through the day, while the amount used should certainly be greater in the daytime.

The waste may be considered to consist of: 1st. Slip in the pumps, which increases the apparent waste, but by which no water is lost. This amount is usually very small, and with good pumps does not exist. 2nd. Errors caused by the recording apparatus of meters. These should be discovered and corrected by testing the meters every few years. The usual effect is to make the amount used appear smaller than it really is. 3rd. Leaks in mains, and at hydrants and valves. These can be discovered by the use of a waterphone or large inferential meter (description of each given later). Large leaks in the mains are usually very noticeable, even above ground, and there is nothing like hot lead to stop them. 4th. The largest and most difficult to check are those leaks caused by bad plumbing, poor fixtures, or Biddy's leaving the faucet open "so as to have the water handy in the morning." Streams of running water are not as many people believe a safeguard against the entrance of sewer-gas. The gas finds it much easier to enter through a trap into which water is dripping than through the same trap filled with still water.

That this waste is enormous I have tried to show; that it is unnecessary you will probably admit; that it should be stopped appears reasonable. Which method of doing this is best depends largely on circumstances. In the Old Country inspection of the premises seems to work very well, but here upon the free soil of the United States even the foreigners object to such treatment. Metering the supply and charging each man with what he gets, gives better satisfaction than any other scheme proposed.

Where meters are to be tried the following questions are usually asked: Will the knowledge that the water is paid for lead to its too restricted use? Can this be remedied by a minimum rate? Would tenants fix the plumbing? Would meters make house inspections unnecessary? How many inspectors would be required? What would be the expense? Should the city pay for the meters? Would the interest on the outlay be more than the cost of the existing extra pumpage? Should fittings be stamped?

In answer to these many questions, I can say: The understanding that water is paid for leads to a more economical use. In but few cases has it been considered expedient to establish a minimum amount for the water bill. The saving of water has usually been effected by replacing poor fixtures by good and placing all fixtures in running order, rather than by cutting down the amount of water used. To show that good fixtures are profitable the case may be cited of a landlord in Lowell, Mass., who, by putting self-closing spring faucets in a tenement house reduced his water bill from $32.50 to $18 per annum—a saving of 14 gallons daily per capita. The question of inspectors must be decided according to circumstances; one man can read and repair 500 meters each quarter of the year, thus a much smaller force will be required than for house inspection. The inspectors should always report location of suspected leaks or waste, and should be competent to examine the suspected premises if the owner desires. A case occurred in Grand Rapids, Mich., last year, where a leak in a pipe in a green-house was discovered through which four and a half million gallons a year were escaping into the sewer with the knowledge of the owners.

Who should pay for the meters? is a subject upon which there has been considerable discussion. Sometimes the owner puts a meter in at his own expense, but the most satisfactory course is for the city to furnish, set and repair all meters. The bill of repairs varies with the kind of meters, but an average yearly cost deduced from seven years' experience of Rochester, N. Y., is 44 cents each. East Saginaw, Mich., reports an average expense in 1889 of 55 cents each for meters.

Whether it is cheaper to pump the water now wasted or to put in meters can best be shown by supposing that a city estimates the loss of water at two million gallons a day, which can be saved by putting in 1,000 meters, other losses not being considered. The meters cost, on an average, $20 each, making a total annual interest on outlay of $1,000. The repair bill at 50 cents a meter would be $500. The salary of two men to read and repair the meters would be $1,200 a year. Clerical work would be no greater than where the people pay a certain rate for each fixture. Hence the total yearly cost of meters would be $2,700. On the other side, to pump one million gallons costs from $6 to $12, depending upon price of coal and distance the water is pumped. Suppose we say $8 for each million gallons, then we find that two million gallons a day would cost $5,840, or over twice what it would cost to save this amount by putting in the meters. He would be an exceedingly poor business man who would not pay 50 cents to save a $1. The city would be much more foolish to expend $1 of the people's money to buy them 50 cents worth of goods.

As it is impossible to furnish the people "water as free as air," it should be the duty of the water board to see that every person gets all that he pays for and that the people are not charged an exceedingly high rate. A reduction of a few cents in the price of a thousand gallons will gladden the heart of many a poor washerwoman, and leave many a workingman more money to invest in luxuries more dear to his heart than bubbling water.

The inferential water meter is a meter which is placed in the mains and which automatically records the height and pressure of the water in the mains, thus furnishing data from which the approximate quantity of water may be determined. The form now most used is called the Deacon waste meter. Another form which will probably be used often in the future is the Venturi meter described by Herschel in the Trans. Am. Soc. of Civil Engineers, vol. 18 (1887), p. 228.

The waterphone is an iron rod with a rude microphone upon one end. The other end is placed upon the pipe and the flow of water in the pipe can easily be heard, especially if, owing to obstructions or vents, the water forms eddies. Leaks in the pipes can easily be detected in this manner. This instrument is used principally at night when but little water is supposed to be flowing. The kind most used is known as the Bell waterphone.

A PLEA FOR ORGANIZATION.

To the Master Plumbers of the State of Illinois.

Office of the State Vice-President of the N. A. M. P., 372 Randolph street, Chicago, Nov. 14, 1890.

GENTLEMEN: The National Association of Master Plumbers of the United States sends greeting and good wishes for your present and future prosperity.

For a great many years the gentlemen engaged in the plumbing business, especially in large cities, have felt the necessity of organizing themselves into associations for educational and social purposes and thereby benefitting each other by an exchange of ideas and opinions on those things which pertain to their trade. There has been a growing demand for many years for a complete change in the manner of constructing and arranging water supply and discharge pipes and also as to the relative value of one kind of material over another for plumbing fixtures. That this demand has been the outgrowth of a defective system no one will deny and when public sentiment is aroused against an existing evil and the tide of reform has set in, it is the duty of every man engaged in the business of plumbing to move with the current of thought and sweep out of existence the past conditions which would make it possible to work such injury to the health of the people. In cities and towns where there is a law governing the plumbing business and where vigorously enforced there is a marked decrease in the death rate. This statement is born out by well authenticated facts. The death rate in Chicago for last year was less then 18 for every 1,000 persons, whereas a few years ago the death rate per thousand was almost twice as great.

The National Association of Master Plumbers is composed of members of state and local associations throughout the country represented by delegates. Its object is the advancement of its members in the field of sanitary science, while both the commercial and social elements are cared for, embracing in all a watchfulness over the health of the family and nation while its endeavors to secure for its members a fair and just compensation for their labor, protecting them from imposition and placing the trade on an equal footing with other well-paid businesses.

This is the period in the history of nations of organized effort in all directions and why not in ours? The master plumber situated in a place where there is no one else in the business must in justice to himself and others acquaint himself with the needs of his trade. Where there are several master plumbers in one

place it is still more urgent that they should form an association; lay aside all personal feelings that arise from competition and venture to suggest to your fellow craftsmen that all things considered it would be better to associate together for a common good of all concerned.

In conclusion the National Association of Master Plumbers has unfurled the banner of reform and progress and it is your duty to assist. Will you do it? If you feel that an association could be affected which would tend to remedy any evils which now exist to the detriment of your business and that a step may thus be taken to advance your interests, I will do all in my power to assist in the formation of an organization whereby these evils may be corrected and the business placed upon a better and more substantial basis.

Either President Robert Griffith of the National Association, 427 North Clark street, or myself will be glad to communicate with you by mail or visit you personally that these ends may be attained. Yours fraternally, David Whiteford,
State Vice-President for Illinois.

LITTLE THINGS THAT COUNT.

In every line of business, no matter whether conducted upon a large or small scale, it is the little things that count. The little expenses, the little wastes, the little economies, are the ones that turn the balance of accounts, either for profit or loss, and it is these little things that need the closest attention. The larger, more important details of every business are carefully looked after; there is very little chance for neglect, carelessness or oversight. The workman who spoils a costly piece of machinery, or causes a loss of any considerable account, is held responsible, and is generally very careful in this respect; but in little things he is not as prompt in exercising care and economy, and these little things are looked upon as of no consequence, and as having no real value.

We have heard it asserted by a man who, beginning on barely nothing, succeeded in building up a large and profitable business, and retiring with a considerable fortune, when asked how he had managed, what was the secret of his success, he replied, by saving what other people wasted, looking after the little things and seeing that not a thing was thrown away or cast aside as too small or insignificant to be of any value. A few cents here and a few there make up quite a sum in the course of a year, and it is by paying careful attention to the little details, by looking after the cents, that I have made my dollars.

There is a great deal more in this than most people would be willing to admit. They are in too much of a hurry to make dollars to look out for the cents.

A poor and incompetent or disinterested workman is not only a poor man to employ because he is this, but because he is wasteful and careless about small things. Take some of our very large manufactories, where hundreds of employes are engaged, and, unless the most watchful care is exercised, the amount of waste that is lost would go far toward paying running expenses.

In these times of close competition, when it becomes an absolute necessity that every possible item be carefully turned to account, the exercise of economy in small things is being more rigidly cultivated, Profits at best are only small, and these are made considerably less by the wastefulness of careless and unthoughtful men.

Nor is it alone in the factory or workshop where the necessity of looking after these little things makes itself apparent. The workingman of to-day, with his wages scarcely sufficient to provide for the comforts and necessities of life, has the most need to practice economy in small things, and it is surprising to note what an amount of waste is made by those who have the most need to practice economy. A few cents here and a few there seem mere trifles, and are not regarded as of any particular consequence, or as having any material relation to the annual expenses; but if a careful account were kept for a single year, the result would be astonishing. And just here is where the difference lies between individuals and corporations. The latter have learned, by a comparison of the strict accounts which are an absolute necessity with them, the lesson of economy in small things. Everything is put down, and can be looked over and studied, and its effect upon the total noted; and this is a lesson which should be learned by individuals, and workingmen especially. By them, as a rule, no account of daily expenses, or even any expense, is kept. They receive their money, and it is spent. At the end of the year not one of them can tell where his money is gone, or for what purpose—whether he has made a profit from the time and labor expended, or not; and for this reason, as well as that he may see where and how he may economize and save something, even if only a small amount, the workman should keep a strict and careful account of daily expenditures and receipts.

Such a course would not only result beneficially to him personally, but would make him a more careful, painstaking and valuable employe. Carelessness at home or in one's personal interests breeds carelessness of others' interests, and there is nothing which an employer notices more quickly, and is more willing and ready to appreciate and reward, than the display of care and interest in the little details by a workman.

It cannot be expected that a man who is careless of his own welfare and interests will exercise any more care than he is obliged to do under the watchful eye of the foreman or proprietor, or care for those of his employer.

It is, then, all-important that every individual exercise this watchfulness of the small things in business and in private life. The employer must guard himself against loss by the carelessness and wastefulness of his employes. The employe should be equally vigilant in his own personal interests, and all should remember that it is the little things that count.—*Manufacturers' Gazette.*

HOW TO SAVE COAL.

A writer in one of the magazines gives these practical hints in regard to the important matter of economy in coal-burning, which may be remembered and heeded with advantage:

The weatherwise predict an early fall and a long, cold winter, but so they did last year and it was a mistake. Be that as it may, fires we are obliged to have, and it makes very little difference—not more than a ton or two—in the whole amount of coal consumed whether the winter is severe or mild. But it does make a very perceptible difference if the coal is wasted, as it usually is, either through ignorance or carelessness. Very few women, servants at least, understand the first principles of making or keeping a fire. They will poke and punch and pack it down from the top, pour in the coal until it is piled above the fire-brick, shutting off all chance of a draft at the top, and then wonder why the fire don't burn, when the poor thing simply can't burn without air. Or, if after waiting weary hours the flames manage to struggle through, the whole top of the stove gets red-hot, but the oven is cold, and no warm air comes up from the register, and when we remonstrate we are told, "The fire is ilegant, marm; please look for yourself." Or perhaps the whole thing is dumped out, the coal, good and bad, thrown away, and the fire started afresh, only to repeat the same thing the very next day perhaps. Indeed, many people permit their fires to go out every night, thinking thereby to save coal, but it is a false economy and a waste of time, strength, coal and wood. A fresh fire consumes more coal than one that is kept burning, besides requiring the additional outlay for wood. One barrel of kindling-wood should be an ample supply for a family for a whole winter; a fire started the right way and properly managed need never go out from the beginning of winter to the end. Before building a fresh fire see that every part of the stove, range or heater is cleaned out; remove all ashes, bits of coal or clinker, and brush off every particle of dust and ashes inside as well as out. Then lay across the bars of the grate, about an inch apart, several pieces of kindling-wood the length of the fire-box and at least an inch in thickness. These will prevent the coals dropping through the grate, and, as they burn, will form a bed of live coals for the fire to rest on. On these sticks of wood place a handful or two of shavings, leaving one sticking through the grate as a lighter. If you have no shavings, you can use pieces of newspaper, not lying flat and smooth across the wood, nor twisted tight and hard, but lightly crumpled together so as to leave a free passage for the air. On the top of these papers or shavings lay a good many very thin sticks of light, dry wood, crossing and recrossing them in all directions, diagonally and straight, resting the ends of them against the sides of the fire-box so as to form a support for the top pieces, else they might press down on the paper and smother the flames. Now you will need some thicker pieces of hard wood, both

long and short, and enough of them to fill the fire-box to the top. Lay these in such a manner that they cross each other at right angles, and put a small shovelful of fine coal on top of all. I know that this is not the usual way to build a fire, but to me it has been the most successful method, and since I have adopted it I have never had to rebuild one; it it sure to burn. Now light the shavings or paper left out for this purpose (after putting on the lids of the stove), and as the fire burns away add coal, a little at a time, alternating with a stick or two of wood until you are sure the coal itself is burning, when you need not use any more wood.

Continue to add coal gradually until it reaches nearly, if not quite, to the top of the fire-brick, never at any time above it. Now that the fire is made, allow it to burn freely until the blue flames disappear; close the front dampers, shut the lower draft entirely, and very nearly close the dampers in the pipe. In the heater this fire will keep and give a steady heat until night, unless the weather is very cold or windy, when you may have to add coal at noon. In the evening rake it thoroughly from the bottom, never from the top; fill it, as in the morning, with fresh coal; allow the blue flames to burn off; open the pipe-damper wide, close all the lower drafts and open the furnace-door. The fire will keep well all night without any apparent change, and, by merely closing the door and partly shutting the damper in the morning, will be bright and hot until after breakfast. Now take up the ashes raked down the night before, then open the dampers and give the fire a good raking, draw out all the slate, stone and clinker, add coal and follow the directions already given. Leave the hot ashes to be taken up the next day, when they will be cold and can be sifted and emptied without danger of setting anything on fire. Many dreadful accidents have occurred from the storing of hot ashes. An ordinary-sized heater managed in this way should not burn more than one ton of coal a month in the coldest weather. The kitchen-range, after having been raked and filled, should be closed entirely, the lids left on, the oven or draft damper open a little way when you want the heat. When a hot fire is not needed, and at night after raking and filling the range and after the blue flames have burned off, leave the lids on, open both the dust-damper and oven-damper, also the little slide or door over the range, provided for the escape of the odors and steam from the cooking. Fixed this way, the coal will not consume at all, but will be ready to give you a quick, hot fire for getting breakfast, by merely opening drafts and dampers. One ton of coal will last two months in cold weather, and three or four months when it is warm. Indeed, the average amount of money spent for coal in one year, for cooking and one heating fire, should not exceed four dollars a month. The same general principles apply to a cook-stove and any good heating stove—namely, to keep the fires free from ashes and clinker, never to pile the coal above the fire-brick, and to exercise intelligence and understanding in the use of the dampers. I have taken care of fires in many different makes of stoves, heaters and ranges, and have kept the fires in good condition from the beginning of October to the last of April without their going out once, and my coal bills have been from one-third to one-half less than some of my neighbors.

PROPORTION.

The whole secret of design in architecture may be summed up in the terms Proportion and Expression, for the differences which mark off one style from another are those mainly derived from the form and proportion of the openings, says *The Building News*. Professor Banister Fletcher, in his opening address to students of architecture at King's college, very appropriately alluded to the subject of proportion, which he illustrated by taking the openings of Somerset House, and by showing by model the effect of first a doorway of half its width in height, next making it a square opening, then adding one-third to the width to the height, and lastly, making the height twice the width.

Though the low opening may be really high enough for a doorway, the mind naturally reverting to the human figure as a standard of proportion, or, to the "fitness" of things, at once condemns the proportion as bad for a doorway. We sometimes it is true see wide entrances to the pits of theatres, drill halls and warehouses; but they invariably look out of proportion—that is, they appear awkward and offensive to our sense of fitness. Even in some Queen Anne houses we have seen doors of about a square which looks contrary to our standard, because we naturally recall to the mind the human proportions, though, as a matter of actual use, the wide opening may be an advantage in getting in or out large pieces of furniture. The manner of teaching proportion which the professor adopted has the merit of oculary demonstrating one of the essential principles of design, for there are many people who imagine that a few inches more or less in the width of a door or window make no difference whatever. The same disregard, or ignorance, of a pleasing proportion is seen in the planning or selection of rooms, as if it made no difference whether the room was square or oblong, and that furniture of a certain size and shape could be made to look equally as well in a square room as an oblong room. The window, like the door, has its own pleasing proportion. We can widen a window, as Professor Banister Fletcher says, but we can easily spoil it by the operation unless we take care to preserve the unit of proportion by sub-dividing the width by mullions, as in a gothic window, or by bringing the eye to rest on proportion of one of the panes. But it is absolutely essential to preserve some unit or individual part in a wide window, or it would be quite as offensive as a wide doorway.

The lesson of proportion need not stop at windows and doorways, it can be applied not merely to plans of apartments and their heights, but to the art of composition itself. For example, Professor Fletcher might have shown that into his first illustration of breaking up a plain building front into parts, proportion enters. If, for example, we take a long, straight facade, perfectly flat of blank wall, or with windows in it, equally distributed, we may have a proportion that offends by its length, and monotony. But break it up by projecting or recessing certain parts, say the two extreme ends and a wide center, and the proportion of the whole is greatly improved, for although not an inch of height has been added the eye is arrested by the three individual parts into which the whole facade has been divided, and the extreme length, being broken by oblongs of the contrary direction, is rendered less fatiguing to the eye. By further dividing, or by making vertical lines, the proportions may be still more altered. The effect mainly due to the fact that the eye attends to the smaller individual parts instead of the whole. To take a concrete case, a continuous barrack front looks much longer than an equal length of houses forming a street of the same height, because each separate house, being an upright oblong, arrests the eye, and the number of stories forms a scale to its real height. In design, then, the value of proportion is in composing the individual parts or subdivisions by giving them the proper ratio of height to width, and so drawing the eye from the proportion of the whole mass to that of the individual parts. What better illustration of this can be found than in towers? We constantly hear people talk of the proportion; it is either said to be squat or too tall, referring unconsciously to a standard in their mind's eye, from which they cannot get away. Thus, for example, St. Paul's dome would look very squat after gazing at a tower and spire like that of Salisbury, and many towers would look too short after seeing the Boston Example. The proper proportion of any particular tower can only be judged by the individual parts or stories of which it is composed. It may look exceedingly tall and disproportioned if the belfry windows are small, and a mere repetition in every stage, but by subdividing the height into stories of unequal height, and by making the openings small here, and large there, the proportions will be pronounced excellent. Therefore proportion is not a matter of mass only, though, of course, we have to see our buildings through dense fogs sometimes, when they ought to look pleasing, but is chiefly to be studied in the smaller parts of design. Bad proportion in a window, a door or a fire-place, will always be an eye-sore in a room, however well proportioned it may be, the same want of pleasing ratio will spoil a wall paper, the paneling of a door or dado, or any ornament, though the eye in the latter cases would have to be more ducated. The ordinary sense of fitness in proportion is, however, pretty general; and, roughly speaking, we may say, that it exists amongst people almost as strongly as the sense of harmony or music. As a discordant note jars on the faculty of hearing so we find a glaring disproportion, or want of fitness, produces an unpleasant sensation on the mind.

Proportion is, however, not confined to ratios and dimensions;

we experience its influence in the right proportion of mass to detail, of plainness to ornament, and these are quite as necessary to learn by those who are studying artistic kinds of expression. The value of models or illustrations in the designs of carpets, wall-papers, decoration applied to furniture and metal work is apparent. We often see patterns offensively obtrusive and distractive, owing to the want of quiet surfaces or a due intermixture of ground and pattern; furniture full of unrestful twists and turns and carvings that distract rather than please; because the artist has not realized a sense of proportion between the plain parts and the ornament. These are things that can be taught by showing how much ornament can be placed on one part without overloading it, what surfaces or members should be plain, and which may be enriched. The whole question of ornament is one of "more or less." The amount of ornament on a surface must indeed be in inverse ratio to the height of relief. Thus every square quarter inch on a Benares brass bowl may be occupied with incised ornament without offence to the eye, for the lines are narrow and the relief exceedingly low; but in repousse work of massive relief in the same metal, anything beyond a simple device broadly treated is felt instinctively to be intolerably coarse. To teach applied design on rational principles, the student is in need not merely of examples in the art he is studying, but of demonstrations or models that will show him the most agreeable combinations. He should not be taught to copy furniture and decoration of various masters and styles, but be taught to realize for himself the due proportion between structures and forms of the plainest and most direct kind and the ornament that should accompany them. It is in these more extended ways we may learn the values of proportion in the arts of design, and not merely in regard to the heights and widths and openings, the proportions of columns and entablatures, and of apartments, which appear to be the only kinds of proportions that are recognized by the Classic revivalists.

AMONG THE PLUMBERS.

H. S. Decker, a well-known gasfitter in Denver, died November 18th, at St. Joseph's Home. Mr. Decker had been in the employ of Sness Brothers for some time, and was a member of the Plumbers' Union.

Edward Wilkes, the successor of Potts & Esche, at 54 State street, is very busy with new work, and reports prospects very flattering for a rushing business.

Andrew McHough, a plumber, living at No. 705 West Ninth street, Wilmington, Del., fell on November 19th from a third-story window while at work on the parsonage connected with Grace M. E. Church, and sustained serious injuries. He fell a distance of about thirty feet upon a pile of small stones. His right thigh was broken above the knee, and, besides receiving about half a dozen other cuts about the body, suffered an ugly scalp wound. The injured man was conveyed to his home, where his injuries were dressed by Drs. Negendank and J. A. Draper. McHough lingered between life and death from the time of his awful fall until seven o'clock the same evening, when he died. He was 40 years old, and leaves a wife and two grown-up daughters. He is a nephew of Councilman McGee, of Wilmington.

Michael Connell, Inspector of Plumbing in the Health Department, has been doing some brave work of late, in saving the lives of a number of people in Chicago. Notwithstanding various threats from those plumbers who persist in doing "skin plumbing," thus endangering the lives of more citizens than so many murderers, this brave officer, within the past week, has brought several of these delinquents to justice. Mr. Connell answered the threats of these enemies of the public health with the reply that he proposed "to perform his duty without fear or favor;" and the large fines that he has succeeded in imposing upon several plumbers prove that he has certainly performed his duty, It may be said, too, that Mr. Connell triumphed in his undertaking without the aid of an attorney. It will be remembered that this same officer is none other than the brave Michael Connell, who not long since saved the life of Alfred Lewis, a painter, who lay in a helpless condition before an approaching train on the Illinois Central tracks. For this brave deed, the Chicago *Globe* speaks of this officer as follows: But for the bravery of Health Officer Michael Connell, Alfred Lewis, a painter living at Roll's hall, would have lost his life on the Illinois Central tracks at the foot of Harrison street. Lewis was attempting to jump from a moving train when he struck against a switch-bar, the shock throwing him directly in front of the south-bound express. Both of his legs were broken, and the poor fellow, unable to save himself, looked appealingly for some one to save him from a horrible death. Officer Connell, who was on the north-bound train, saw Lewis' predicament, and, jumping from the cars, ran to his rescue. He just succeeded in dragging him from the track as the express train went thundering by. Too much praise cannot be given Connell for his prompt action, for had he hesitated a moment Lewis would have been ground to pieces.

The Health Department scored a victory last week by rolling up some large fines against several plumbers. The largest fine was against one, James Gormley, who was doing some plumbing work on Archer avenue near Thirty-ninth street. Mr. Gormley has done the plumbing in several buildings in this locality and all his work has been in open violation of the Health Department rules and regulations. After giving a three days notice to comply with said rules, Inspector Michael Connell investigated the work and found that Mr. Gormley persisted in opposing the Health Department. The inspector went before Justice Wallace and swore out two warrants against said Gormley, one for violating section 1393 of the city ordinance, and the other for violating section 277 of the revised statutes. For violating the former section a fine of $10 and costs was imposed, and for violating the latter a judgment for $100 and costs was rendered, making in all a penalty of $110 and costs. The points covered in this case were the same as those raised in the celebrated John Lavery case which recently tested the power of the Health Department in controling new plumbing work. The recent victory of the Health Department will certainly demonstrate to certain plumbers that the department is a dangerous thing to fool with.

Charles Uher, a Chicago plumber, who was doing some work on Eighteenth street, near Centre avenue, was arrested on the 9th of November by the Health Department, for defective plumbing. The case came up before Justice Doyle on November 14th, but a continuance was granted until the 20th, and the defendant given an opportunity to fix his work according to the rules and regulations of the Health Department. An inspector visited the premises in question on the 19th, and found that the defective plumbing had been taken out and the rules of the Health Department complied with in every respect. Justice Doyle, therefore, let Mr. Uher off with a $10 fine and costs, accompanied with a lecture on the obligations of a plumber to the public.

The Wilmington (Del.) *Morning News*, of November 20, gives the following account of the recent plumbers' strike in that city: "Twenty-one plumbers, at work in the shop of the Pullman Palace Car Company, over Eleventh-street bridge, struck for an advance of wages on Tuesday afternoon, and left the shop in a body. The men had previously demanded an increase of 25 cents per day, and, as their demands were not acceded to, they quit work. There are ten gasfitters among the strikers, and a number of plumbers' helpers. The company has advertised for a number of plumbers to take the places of the men who have gone out. A meeting of the Plumbers' Union was held soon afterward in the rooms of the Brotherhood of Railroad Brakeman, Third and Market streets. The union decided to stand by the strikers. They also resolved that members shall not be allowed to change from one boss to another, and if union men come here from other places they will have to be paid the wages received by the workmen here."

L. H. Buddemer, a prominent plumber of Portland, Oregon, writes that the Master Plumber's Association of his city is in a flourishing and healthy condition, but the sanitary condition of that locality is not the best in the world. The Legislature, however, is to meet soon when it is hoped that some sanitary laws will be passed, which will forever put an end to tinkering plumbing. Mr. Buddemer desires some points in regard to apprentice laws, etc. The same mail brought us a copy of Portland illustrated, which shows that this is quite a city, notwithstanding Porter's recent census. Owing to increasing business Mr. Buddemer has been compelled to seek larger quarters and has moved his shop from 28 South Fifth street to 185 Third street.

The Duffy Bros., of San Francisco, will do the plumbing work in a new ten-story building in that city. A member of this firm recently visited Chicago to purchase the goods for this building.

E. H. Israel, of the L. M. Rumsey Manufacturing Company, made a business trip to Chicago this week, and visited the leading show rooms in the city during his short sojourn.

H. H. Meerhoff, who conducts a first-class plumbing shop at No. 9 South Ninth street, Richmond, Ind., was shaking hands with the Chicago boys a few days ago.

F. W. Barclay, representing Frank Barclay, of Beatrice, Nebraska, called at the L. Wolff show rooms last week.

THE LADIES' AUXILIARY SOCIETY.

Grand Army Hall presented a gay appearance on Thanksgiving evening, when the plumbers began to arrive with their handsome wives, pretty daughters and lovely sweethearts.

The Chicago Master Plumbers' Association had agreed to do away with their regular meeting on this particular evening and had yielded the hall to the ladies, who entertained their guests in their usual pleasant manner.

The carpets had been removed from the floor, and sweet strains of music greeted the ears of the guests as they entered the building. A Grand Army man, with an ice cream plug hat strayed in, and thinking from the gayly bedecked hall that it was some G. A. R. blowout, proceeded to remove his summer head gear and to make himself at home. After he had gone through two or three waltzes, he began to notice the scarcity of old soldiers, and asked what kind of an entertainment it was that drew so few comrades. He was immediately informed that he had the honor of being at a plumbers' dance, whereupon he began to think he was an unwelcome guest, and immediately departed for parts unknown. Mr. A. W. Murray, on behalf of the ladies, assured the veteran that they would be pleased to have him stay, but his entreaties were of no avail.

A great number of the plumbers had eaten too much turkey, so that they were unable to get down very early, but they succeeded in the latter part of the evening to make up the time they lost in the forepart.

Music and dancing were the principal features of the entertainment, but those who did not dance improved the opportunity to have a good time socially.

The floor committee was composed of Messrs. William Gay, J. H. Roche, and J. F. Mathews, who discharged their duties in a very creditable manner.

The entertainment was a very enjoyable one throughout, and the master plumbers at a late hour departed from the Grand Army Hall, voting the last entertainment of the ladies a grand success.

The Ladies' Auxiliary Society is in a flourishing condition, and has several hundred dollars in the treasury. The organization is a great help to the master plumbers in a social way, and brings them in a closer relation with each other. The officers of the society are Mrs. J. J. Hamblin, president; Mrs. A. F. Irons, secretary; Mrs. W. Murray, treasurer, and Mrs. Andrew Young, first vice president.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Kirkwood, Wis.: Edbrooke & Burnham, of Chicago, are making plans for a two-story residence.——Evanston, Ill.: W. L. Carroll, of Chicago, is making plans for a two-story residence. ——Brooklyn, N. Y.: Fourth street, near Sixth avenue, six three-story brick and stone dwellings; cost, $24,000. Geo. M. Miller. architect. Madison street, near Sumner avenue, two four-story brick flats; cost, $20,000. Wm. Godfrey, architect. Jefferson avenue, near Tompkins avenue, five three-story brick and stone dwellings; cost, $50,000. F. D. Vrooman, architect.——Chicago, Ill.: Clark street near Deming Court, a two-story residence; cost, $10,000. W. L. Carroll, architect. Oakenwald avenue, near Forty-fifth street, a three-story residence; cost, $15,000. L. G. Halberg, architect. Ellis avenue and Forty-sixth street, a three-story residence; cost, $30,000. O. W. Marble, architect. George H. Borst is taking bids for remodeling the building at 1517 Michigan avenue. Faher & Pagels are working on plans for a ten-story hotel to be erected on Cottage Grove avenue; cost, $200,000. Sixty-fourth and Harvard streets, a three-story flat building; cost, $20,000. R. S. Smith, architect. Ashland avenue and Indiana street, a four-story apartment building; cost, $20,000. E. H. Tusnock, architect, The same architect is making plans for a four-story store and apartment building to be erected on Cottage Grove avenue; cost, $30,000. Michigan avenue, near Thirty-sixth street, a three-story residence; cost, $20,000. J. C. Zarbell, architect. He is also taking bids for a two-story flat building to be erected on Forty-eighth street and another on Twenty-third street. Frank L. Lively is drawing plans for a two-story residence to be erected at Morgan Park. Indiana avenue, near Forty-seventh street, four two-story dwellings; cost, $20,000. Howe & Shelton, architects. 12-16 Ferdinand street, a two-story bottling factory; cost, $100,000. G. Bloedner & Co., architects. Henry Sierks is making plans for a two-story residence to be erected on Kedzie avenue; cost, $12,000. Grand boulevard, near Forty-fourth street, four three-story residences; cost, $60,000. H. R. Wilson, architect. Grand boulevard, near Thirty-sixth street, a three-story residence; cost, $20,000. J. A. Tham, architect. Archer avenue, near the Alhambra theatre, a four-story store and flat building and a six-story storage house; cost, $50,000. Perley Hale, architect. Fremont street and Belden avenue, a three-story flat building; cost, $16,000. W. L. Carroll, architect. Belden avenue and Larrabee street, a six-story apartment building; cost, $80,000. L. G. Halberg, architect. Perry avenue and Sixty-eighth street a two-story residence. R. S. Smith, architect.——New York City: West End avenue, near Ninty-eighth street, eleven three-story brick dwellings; cost, $114,000. Baring & Felton, architects. Central Park, near Eighty-third street, a seven-story brick and stone flat; cost, $100,000. Denman & Fischer, architects. 117th street, near Eighth avenue, two five-story brick flats; cost, $36,000. H. Damdson, architect. Seventy-second street, near avenue A, two five-story brick flats; cost, $46,000. Edward Wenz, architect. Sixty-third street, near Amsterdam avenue, two five-story brick flats; cost, $22,000. Jas. W. Cole, architect. 141st street, near Alexander avenue, four five-story brick stores and flats; cost, $73,000. Andrew Spence, architect. Seventieth street, near Columbus avenue, five four-story brick and stone dwellings; cost, $25,000. G. A. Schellinger, architect. Eightieth street, near Ninth avenue, three four-story brick dwellings; cost, $45,000. G. A. Bagge, architect. Ninetieth street, near West End avenue, seven three-story brick dwellings; cost, $84,000. T. J. Sheridan, architect. West End avenue, near Seventy-seventh street, fourteen residences. Lamb & Rich, architects. Corner Macdougal and Vandam streets, a five and six-story tenement and store building; cost, $100,000. A. Spence, architect. Ninty-second street, near Ninth avenue, three three-story residences; cost, $35,000. S. F. Belham, architect. 154 West Thirty-fifth street, a seven-story brick and iron warehouse; cost $40,000. James W. Cole, architect. Seventy-sixth street, near Columbia avenue, five four-story brick and stone dwellings; cost, $125,000. Thom & Wilson, architects. 51 Pitt street, a five-story brick flat; cost, $20,000. Frederick Ebeling, architect. Corner of Henry and Birmingham streets, a seven-story brick store and flat building; cost, $61,000. Chas. Baxter, architect. 87 Sheriff street, a five-story brick flat; cost, $20,000. Charles Rentz, architect. 492-94 Broome street, a six-story brick store and flat building; cost, $85,000. Alfred Zucker, architect.——Suffern, N. Y.: A large residence will soon be built for Mr. Chadick; cost, $25,000. F. R. Fava, Jr. & Co., Washington, D. C., architects.——Raynor, Tex.: The Methodist society will expend $40,000 on their new edifice.——Comanche, Tex.: A $65,000 court house will be erected.——Fort Worth, Tex.: Mayor Smith recommends that a city hall be erected to cost $125,000.——Denver, Col.: Lincoln avenue, near Twentieth street, a new club building; cost, $35,000. Address Progress Club. Stout street, near Sixteenth a four-story brick block; cost, $22,780. Address Louis Price. Lawrence street, near Twentieth, a three-story brick hotel building; cost, $30,000. Address George Bailey. Logan avenue, near Colfax street, a two-story brick dwelling; cost, $28,000. Address J. E. Blake.——Lincoln, Neb.: F. C. Fiske has plans for a bank and office building; cost, $40,000. He has also prepared plans for a handsome private residence for William Barr.——Omaha, Neb.: Thirty-second street, near Dodge street, a private residence; cost,

$40,000. J. Latener, architect.——Milwaukee, Wis.: Corner Buffalo and Broadway streets, a large business block. Address Harrison Ludington for particulars. H. Mesmer has plans for a store and flat building to be erected on the corner of Third and Lloyd streets; cost, $15,000.——Fort Worth, Tex.: The Hendricks block to be erected on Main street will cost $150,000. Hagart & Sanguinett, architects.——Pecos, Tex.: A large depot and hotel building will be erected. Address the mayor for particulars.——Denver, Col.: The Presbyterians will erect a new church building.——Salt Lake City, Utah: A six-story hotel building will be erected; cost, $850,000. Adler & Sullivan, Chicago, architects. R. Bowman has plans for a five-story brick building; cost, $50,000. Thompson & Weigle have plans for a brick livery stable; cost, $10,000.——Manti City, Utah: A large hotel building will be erected. Address the mayor for particulars.——Minneapolis, Minn.: A large factory will be erected on Lyndale and Third avenues.——Little Rock, Ark.: Corner Markham and Commerce streets, a four-story store building; cost, $20,000. J. H. Rickon, architect. The same architect has plans for three handsome residences to be erected on Lincoln avenue.——Danbury, Conn.: The Swift Beef Company will erect a new building on Ines street.——Washington, D. C.: 1730 H street, a six-story apartment building. Hornblower & Marshall, architects. The Metropolitan hotel building will be enlarged; cost, $40,000. A. P. Clark, Jr., architect. Hornblower & Marshall have plans for a $35,000 residence to be erected on Massachusetts avenue. Chas. A. Harkness has plans for a large factory building to be erected on E street, near Twenty-second. 1734-38 Fifteenth street, three dwellings. George A. Shehan, architect.——St. Louis, Mo.: Choutean avenue, near Compton avenue, a two-story brick store and office building; cost, $30,000. Mo. P. R. R. Company.——Cincinnati, O.: Central avenue, eighth ward, a three-story warehouse; cost, $75,000. S. W. E. Field, architect. 74-80 Gest street, a two and one half story packing and smoke house; cost, $20,000. A. J. Bast, architect. Vine street, near Pearl, a four-story business building; cost, $10,000. M. Bumbaugh, architect.

HEATING AND LIGHTING.

Frostburg, Md.: A new electric light company will be organized. Address the Gas Light Company.——Weldon, N. C.: Electric Lights will be erected. Address the Mayor.——Orange, Tex.: The Orange Ice, Light and Water-Works Company is to erect an electric light plant.— Bedford City, Va.: The Bedford Electric Company is to put new machinery in its electric light plant.——Port Deposit, Md.: The Port Deposit Electric Light Company will probably rebuild its electric light plant.——Asheville, N. C.: The Asheville & Craggy Mountain Railway Company, W. B. Gwyn, president, wants estimates on electric plant (in duplicate), including boiler, etc., capable of generating 125 to 150 horse power on full strain.——Washington, D. C.: A syndicate has purchased a site for the erection of an electric light plant at Washington, D. C. Francis Hufty can give information.——Coon Rapids, Ia.: The city has voted to expend $2,000 for a fire engine, hose, etc.——Omaha, Neb.: Bids are wanted for the construction of six new fire engine houses, one to cost about $7,000 the rest about $4,000 each.——Denver, Col.: At a meeting of the fire commissioners Chief Pearse was authorized to buy 2,000 feet of hose. It was recommended that a hose house be erected in Wyman's addition, and that a steamer and engine house be established in the First ward. The commissioners approved of setting aside $15,000 for completing the fire alarm and patrol system.——Brooklyn, N. Y.: The Navy Department has advertised for proposals for putting in a complete electric light plant in the New York Navy Yard. Bids will be opened Dec. 16.——Granville, N. Y.: The town has voted to install an electric light plant.——New York City. At a recent meeting of the Gas Commission it was decided to advertise for bids to supply 1,386 electric lights on the streets and parks, bids to be in before Dec. 4th.——Tampa, Fla.: The Florida Electric Company will put in additional machinery. Dawson, Ga.: C. G. Barfoot, is organizing a $30,000 stock company to operate the electric light plant.——Marietta, Ga.: The Marietta Electric Company will put new machinery in its electric light plant.——Hagerstown, Md.: A franchise has been granted for the erection of an electric light plant and the construction of water-works.——Salem, Mass.: The common council has passed an order appropriating $20,000 for the purchase of a hook and ladder truck and for the purchase of a plot of ground and the erection of a steam fire engine house.——Elberton, Ga.: Swift, Wilcox & Braswell want to correspond with manufacturers of electric light machinery.——St. Paul, Minn.: At a recent meeting of the St. Paul Fire Commissioners a resolution was adopted recommending the purchase of a new fire engine, hose, wagons, harness and three horses, the estimated cost of which is $6,925, the entire outfit to be placed at Merriam Park for the protection of property in the Midway district.——Darlington, S. C.: The Darlington Light, Water and Power Co. has been organized with a capital stock of $25,000, to erect an electric light plant and construct water-works.——Birmingham, Ala.; E. W. Rucker, A. G. Bond, T. W. Seddon and others have organized a stock company for the purpose of utilizing the fumes from the coke ovens about the city for making illuminating gas.——Henderson, Ky.: The Henderson Electric Light and Power Company is being organized. It will have a capital stock of $50,000.——Huntington, W. Va.: It is stated that F. B. Enslow, D. W. Emmons, J. H. Russell and others are having plans prepared with a view to building gas-works.——Knoxville, Tenn.: Biddle Bros. will want pipe-cutting machines.——Roanoke, Va.: The Crozer Iron Company will erect an electric light plant at its iron furnaces.——Barto, Fla.: J. W. Brady and others have organized a stock company, to be known as the Barto Light and Water Company, for the purpose of erecting an electric light plant.——Salt Lake City, Utah: At a meeting of the stockholders of the Salt Lake Power, Light and Heating Company, the following Board of Directors was chosen: P. L. Williams, George M. Scott, W. S. McCormick, James Moffat, Frank H. Dyer. Pittsburg, Pa. A company has been organized to manufacture large meters for natural gas. Mr. George W. Simonds is at the head of the company, and with him are associated Messrs. John F. Scott, Oliver C. Pudan, Charles B. McLean and Thomas Woods. The machine shop of Sterritt & Thomas has been purchased, and the meter, which is the invention of Mr. Pudan, will be manufactured there.

SEWERAGE NOTES.

Highland Park, Ill.: The city council has adopted a plan for a new sewerage system.——Knoxville, Tenn.: A plan for a new sewerage system will soon be adopted. Address the Mayor.——Manville, R. I.: A sewerage system is badly needed, and decided action will soon be taken on the subject.——Austin, Tex.: The construction of a sewerage system, at a cost of about $21,000, is under discussion. W. B. Brush can give information.——Hendersonville, N. C.: The city has issued $13,000 bonds for extending water-works and constructing sewerage system.——Columbia, S. C.: D. B. Miller is preparing plans for the construction of a sewerage system.——Salem, Va.: A sewerage system will be constructed.——Nashua, N. H.: The Artillery Pond sewer is approaching completion. It will be five feet below the grade of the old sewer.——Newark, N. J.: The commissioners appointed by the Supreme Court of New Jersey to assess benefits for the intercepting sewer, including pumping station and wood flume in Newark Bay, report that the whole cost should be paid by the city.——Pittsburg, Pa.: The Chief of the Department of Public Works has been directed to advertise for proposals for the construction of 20-inch pipe sewer on Black street, and a 15-inch pipe sewer on College street.——Columbus, O.: Several catch-basins and sewers in the eastern part of the city are said to need repairing, but there is no money in the sewerage and drainage fund, and other means will have to be found to raise the necessary money.——Lexington, Ky.: A system of sewerage is projected, and Mr. Snowden, city engineer of Louisville, has been asked to prepare plans and estimates.——Brunswick, Ga.: The West Sewerage and Sewage Utilization Company will put in a West system of sewerage. The Lookout Sewer Pipe Company of Chattanooga, Tenn., will furnish 17 miles of pipe.——Jacksonville, Fla.: A sewer will be built on Commercial street, with an iron outlet pipe extending into the river, 25 feet below low water.——St. Paul, Minn.: For sanitary reasons, the Health Commissioner recommends that all houses should make sewer connections. There are over 18,000 sewer connections built, about 150 to the mile, but only 4,500 houses are actually connected with the sewers. A good deal of sickness has been reported from houses not having the connections.

WATER-WORKS NOTES.

Gainesville, Fla.: The city is badly in need of water-works, a sewerage system and electric lights. It will take $150,000 to secure the needful improvements.——La Harpe, Ill.: Water-works will be constructed.——Pittsburg, Pa.: The Monongahela Water Company is having a large iron building placed over its new boilers. A new Worthington pump is to be put in with a capacity of 10,000,000.——Galveston, Tex.: A number of artesian wells will be sunk along its line by the Galveston, Harrisonburg and San Antonio Railway Co.——Longview, Tex.: The construction of a system of water-works is projected.——Ladonia, Tex.: An artesian well will probably be sunk.——Buchanan, Va.: J. H. Harlow of Pittsburg, Pa., is preparing plans for a system of water-works to be constructed in Buchanan, Va., by the Central Land Co., at a cost of $100,000.——Rome, Ga.: The Pattillo Printing Co. wants prices on two to four horse power water motor.——Atlanta, Ga.: Bids for a pump are wanted by M. Stoner.——Fargo, N. D.: Mayor Hall has signed the ordinance providing for the issue of $30,000 bonds for purchasing and constructing water-works.——Corsicana, Tex.: The sinking of an artesian well is probable.——Galveston, Tex.: The water-works committee has recommended the acceptance of the bid of J. P. Miller & Co., of Chicago, Ill., for the sinking of a 6-inch artesian well.——Dallas, Tex.: W. J. Williams has received franchise for the construction of water-works.——Batesville, Ark.: Bids for some pipe and pumps wanted by A. F. Benson.——Clarksville, Tenn.: Bids for some pipe and valves wanted. Address, W. A. Settle.——Shelby, Ala.: The Shelby Manufacturing & Improvement Co., is constructing the water-works.——Bay City, Mich.: Bay City will issue bonds for $50,000 for the improvement of its water-works system.——Cincinnati, O.: The London Water-works Company, London and Cincinnati, Ohio, has been incorporated. Capital, $150,000.——Belvidere, Ill.: The Belvidere city council has appropriated $35,000 for a water-works system.——Avoca, Ia.: Avoca has voted $10,000 for water-works.——Little Rock, Ark.: The St. Louis & Iron Mountain Railway Co. will construct a system of water-works in Little Rock, Ark.——Dublin, Ga.: A system of water-works will be constructed. A. H. McLaws can give information.——Tyler, Tex.: E. N. Orkney wants the latest improved well-sinking tools.——Montgomery, Ala.: The city will apply to the next legislature for authority to issue $495,000 of bonds, to be payable in 30 years, and to bear a rate of interest not exceeding 6 per cent. The proceeds are intended for municipal improvements, including $400,000 for purchasing and enlarging the water-works and $20,000 for refunding market-house bonds.——Ashville, Ala.: The Ashville Land & Improvement Co. has received a franchise to construct water-works.——Chattanooga, Tenn.: The East Chattanooga Land Co. has let contract for the construction of a system of water-works.——Knoxville, Tenn.: Biddle Bros. will want pumps and supplies.——Cleveland, Tenn.: J. L. Young wants estimates on the cost of complete water-works for a city of 5,000 inhabitants.——Fort Payne, Ala.; N. H. Trask wishes to purchase 3,000 feet 4-inch wooden pipe. Newport, Tenn.: The Newport water-works has been incorporated.——Whitman, Mass.: A special town meeting will soon be called for the purpose of taking action on a new water supply. An engineer has been investigating a system of artesian wells and will render a report.——Valdosta, Ga.: The city council is considering a proposition of a Chattanooga firm to put in a system of water-works. In case the proposition is rejected, the council will at once try an experiment for an artesian well.——Neenah, Wis.: The Kimberly & Clark Company has bought the De-Pere water-works and formed a new company, known as the Shattrick & Babcock, with a capital stock of $50,000.——Texarkana, Tex.: The West-Side water-works have been sold for $36,000 to W. L. Whitaker, who proposes to improve and operate them.——Dayton, Wash.: Plans for water-works have been completed. The works will cost $75,000.——Dallas, Tex.: Mayor W. C. Connor with T. W. Crutcher and A. H. Hamilton, members of the city council; D. P. Mayhoney, superintendent of the water-works; T. R. Ravley, auditors and D. A. Royer, city engineer, recently visited Memphis, Tenn., and inspected the Artesian Water Company's system, with a view to adopting a similar one at Dallas.——Denver, Colo.: The Denver City Water Company, with a capital stock of $7,000,000, which has just been incorporated, is a reorganization and consolidation of the old Denver Water Company, the Beaver Brook Water Company and the Mountain Water Company—the latter two of Highlands. The directors are W. P. Robinson, C. B. Rhodes, J. H. Pullen, M. A. Wheeler, W. F. Hawes, W. F. McCue, Jr.; H. N. King, Philip Feldhauser and J. C. Montgomery. The officers are President, W. P. Robinson; vice-president, J. H. Pullen; secretary, M. A. Wheeler; treasurer, C. B. Rhodes.——Bristol, Tenn.: H. T. Farnsworth of Richmond, Va., is investigating at Briston, Tenn., with a view of establishing works for the manufacture of water wheels and pulleys, with compressed air as motive power.——Snohomish, Wash.: The new system of water-works to be constructed at Snohomish by City Engineer Stixrud of Seattle and his associates will include pumping engines of 1,000,000 gallons aggregate capacity, and not less than three miles of iron pipe from four inches to twelve inches in diameter. The water will be pumped to a stand pipe on the highest elevation in the city.——Columbia, S. C.: The city council has decided in favor of the proposed scheme for improving the water supply system. The legislature will be asked to authorize the city to borrow $75,000 for the purpose.——Yorkshire Centre, N. Y.: There is talk of water-works construction.——Forest Grove, Ore.: R. A. Habersham has completed the preliminary survey for a pipe line to supply Forest Grove with water. The water is to be taken from Gale creek, about three miles above the town, where there is a plentiful supply of good water.——Sandy Hill, N. Y.: The Water Power Company has perfected its organization by the choice of John H. Derby, president; Wm. B. Baldwin, vice-president; Grenville M. Ingalsbe, secretary, and Charles T. Beach, treasurer.——Belleville, Ill.: Mr. Rutz of Chicago and other capitalists interested with him propose to furnish Belleville with a system of water-works which shall afford a water supply of 3,000,000 gallons of water per day, and the water will be obtained either from a subterranean stream supposed to exist at the foot of the bluffs, from Pittsburg Lake, or it will be pumped directly from the Mississippi River into an immense reservoir on the bluffs, and thence piped to Belleville. A company with ample capital for the enterprise is to be organized.——Perris, Cal.: The proposition to issue $440,000 in bonds to pay the cost of bringing water for irrigation and other purposes from the Bear Valley reservoir, was carried by a vote of 70 to 1.

BIDS AND CONTRACTS.

Bay City, Mich.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 4th day of December, 1890, for all the labor and material required for the excavation, concrete foundations, stone and brick work of the basement and area walls, first floor iron beams and girders and columns in basement, for the United States Court-house, Post-office and Custom-house building at Bay City, Mich., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Bay City, Mich.——Boston, Mass.: Sealed proposals, addressed to the Hon. Thomas N. Hart, Mayor, and indorsed "Proposals for the Erection of a Grammar School-house, corner of Wells Avenue and Washington street, Ward 24, Boston," will be received at the office of the City Architect, City hall, Boston, until 12 o'clock M. Saturday, December 6, 1890, and at that time will be publicly opened and read. The prices proposed must be stated both in writing and in figures, and all proposals containing bids not called for in this advertisement will be cousidered informal. Each bid must be signed by the bidder and accompanied by a properly certified check for $1,000, payable to the City of Boston, said check to be returned to the bidder unless forfeited under the conditions herein stipulated. The amount and character of the securities for the fulfilment of the contract will be determined by the City Architect after the proposals are opened. If a bond is required with the contract, the sureties thereon must be resident of Massachusetts and satisfactory to the City Architect. The person or persons to whom the contract may be awarded will be required to appear at this office, with the securities offered by him or them, and execute the contract within four days (not including Sunday) from the date of notification of such award, and the preparation and readiness for signature of the contract; and, in case of failure or neglect to do so, he or they will be considered as having abandoned it, and the check accompanying the proposal shall be forfeited to the City of Boston. Specifications and plans may be seen at the office of the City Architect, City Hall

after Wednesday, November 26, 1890, and the proposals are to be filled out on blank forms to be obtained at that office. The City Architect reserves the right to reject any or all bids, should he deem it to be for the interest of the City of Boston so to do. H. H. Atwood, City Architect.——Cleveland, O.: Two Worthington Compound Duplex Pumping Engines, each having a capacity of 5,000,000 gallons per 24 hours. Low pressure cylinder, 63⅜ ins. High pressure cylinder, 21 ins. Water plugers, 21 ins. Stroke, 36 ins. Suitable to work against a limited pressure of 85 lbs. per sq. in. For further information inquire of J. H. Cooper, No. 43 Euclid Ave.——New York, N. Y.: Sealed proposals in triplicate for construction of breakwaters at Portchester Harbor, N. Y., and at Larchmont Harbor, N. Y., will be received at room 74, Army Building, 39 Whitehall street, office until twelve (12) o'clock noon on Monday, December 15, 1890. The attention of bidders is invited to acts of Congress approved February 26, 1885, and February 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Further information can be obtained at this office. Applications should be indorsed on envelope "Applications for specifications." D. C. Houston, Colonel of Engineers. Sealed proposals in triplicate for extension of the breakwater at Glen Cove, N. Y., will be received at room 74 Army Building, 39 Whitehall street, office until twelve (12) o'clock noon on Monday, Dec. 15, 1890. The attention of bidders is invited to acts of Congress approved Feb. 26, 1885, and Feb 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Further information can be obtained at this office. Applications should be indorsed on envelope "Applications for specifications." D. C. Houston, Colonel of Engineers.——Augusta, Ga.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 9th day of December, 1890, for all the labor and material and fixing in place complete the low-pressure, return-circulation, steam-heating and ventilating apparatus for the United States court-house, post-office, etc., building at Augusta, Georgia, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Augusta, Ga. Each bid must be accompanied by a certified check for $100. The department will reject all bids received after the time herein stated for opening the same; also bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Low-Pressure, Return-Circulation, Steam-Heating and Ventilating Apparatus for the U. S. Court-House, Post-Office, etc., building at Augusta, Georgia," and addressed to Jas. H. Windrim, Supervising Architect.——Vicksburg, Miss.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 10th day of December, 1890, for all the labor and material required for the approaches to the U. S. court-house, post-office and custom-house at Vicksburg, Miss., in accordance with the drawing and specification, copies of which may be had on application at this office or the office of the superintendent, at Vicksburg, Miss. Each bid must be accompanied by a certified check for $100. The department will reject all bids received after the time herein stated for opening the same; also all bids which do not comply strictly with all the requirements of this invitation. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the approaches of the U. S. Court-House, Post-Office and Custom-house at Vicksburg, Miss.," and addressed to Jas. H. Windrim, Supervising Architect.——Charleston, W. Va.: Proposals for building the foundations and the pier, abutment, etc., for a movable dam at Lock No. 8 of the Great Kanawha river improvement, will be received at this office until 3 P. M. of December 19, 1890, and then opened. The attention of bidders is called to the Acts of Congress approved Feb. 26, 1885, and Feb. 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Information can be obtained by application to Addison M. Scott, Resident Engineer. Wm. P. Craighill, Colonel of Engineers, U. S. A. ——New York, N. Y.: Sealed proposals, in triplicate, for extension of the breakwater at the mouth of the Housatonic river, Connecticut, will be received at room 74, Army Building, 39 Whitehall street, until 12 o'clock noon on Monday, Dec. 15, 1890. The attention of bidders is invited to Acts of Congress approved Feb. 26, 1885, and Feb. 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Further information can be obtained at this office. Applications should be indorsed on envelope "Applications for Specifications." D. C. Houston, Colonel of Engineers.——Victoria, B. C.: Tenders will be received up to 4 o'clock P. M. on the 17th day of December at the office of the undersigned, for the construction of sewers for the corporation of the city of Victoria, B. C. For particulars of plans and specifications apply at the city hall, Victoria, after the 15th day of November. Five per centum of the approximate amount of the work tendered for will be required to be deposited with a tender to insure its consideration. This may be done either in cash or by certified check on some bank in British Columbia. All cash or certified checks to be returned to unsuccessful tenderers. Estimated cost of sewer, $300,000. The lowest of any tender not necessarily accepted. By order Wellington J. Dowler, C. M. C.——New York City: Bids are wanted until December 4th for supplying about 1400 electric lamps for the streets and parks. Address the Park Commissioners.——Belvidere, Ill.: Sealed proposals will be received by the city council until 7 o'clock P. M. of Tuesday, December 16, 1890, for the construction of a system of water-works, according to plans and specifications of the same, which may be seen at the office of Geo. H. Hurlbut, chairman of the water-works committee. All proposals must be sealed and marked "Proposals for Water-works," and must be in the hands of said Geo. H. Hurlbut on or before the time stated above. Each and every proposal must be accompanied with a clearing-house check for the sum of $250, made payable to the city treasurer of said city, as a guarantee of good faith, the same to be returned to the bidder when his proposal is rejected, or when accepted, and a proper bond deposited with the city council. The works to be constructed are, in general terms, as follows: Pump-house, with boiler and pumps; storage reservoir; stand tower; six miles of pipe line, and twenty-two fire hydrants. Proposals will be received for the entire system complete, and also for labor and material separately. The right is reserved to make any addition to, or reduction from, the materials to be furnished, and work done, under the accepted proposal, at a fair price, to the amount of fifteen per cent of the same, at any time before the materials have been ordered, or the work done, and the right is still further reserved to reject any and all proposals. A. E. Jenner, City Clerk.

NEW TORONTO SLEEPING CAR LINE.

The Wabash Railway, in conneetion with the Canadian Pacific Railway, has just put on a new line of through sleepers between Chicago and Toronto. They will leave Chicago daily at 9:05 P. M., via Wabash, and arrive at Toronto next evening. Returning, they will leave Toronto at 2:30 P. M., daily, via Canadian Pacific, and arrive at Chicago at 7:15 A. M.

The above is in addition to the through Montreal sleeper, via same lines, leaving Chicago daily at 3:00 P. M.

Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

BURLINGTON ROUTE—BUT ONE NIGHT TO DENVER.

"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

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The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Milwaukee, St. Paul and Minneapolis.

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The berth reading lamp feature in the Pullman Sleeping Cars run on these lines is patented, and cannot be used by any other Railway Company. It is the great improvement of the age. Try it and be convinced.

For tickets, sleeping car reservations, and all information, apply at the Company's ticket office, 207-209 Clark street, or at its Passenger Station, Madison, Canal and Adams streets.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

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The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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THE Massachusetts Board of Health has investigated the matter of selling a certain class of poisons without being properly so labeled. The result of this investigation is bearing fruit. The Board discovered that "Madam Ruppert's Face Bleach" and "Madam Yale's Complexion Bleach" were solutions of corrosive sublimate, and were sold without being labeled as poisons. In consequence of this, the agents of these cosmetics have been legally proceeded against for selling poisons contrary to law. There are many just such nostrums sold everywhere and every day, in open violation of both the spirit and letter of the law governing the sale of poisons, and it is time that some action was taken to stop this dnngerous practice. All must grow old; wrinkles will come, and the "sear and yellow" complexion; and all the humbugs on earth cannot alter nature's laws, or fix the charms of youth on the face of old age.

A CASE is reported where a man took patent pills till he had to send for a reputable practicing physician to save his life. The pills are still on the market, along with many other nostrums that should be entirely suppressed.

REMEMBER, when you are having a residence plumbed, you are fitting up a place in which to live. It can be constructed open to all the dangers of disease, or made secure against them. The one may cost a little more than the other, but it is cheaper to pay more for health than less for sickness.

THE address, which was published last week, of David Whiteford, State Vice-President of Illinois, and directed to the plumbers of this state, is worthy of deep consideration. If the plumbers of this or any other state, who are not members of the master plumbers' organization, would look over the history of that organization for the past few years, they could not formulate a single reason for not joining it. It has made a record of which any man may well be proud. It is in the fore rank of the great organizations of this country, and occupies a place in the esteem and confidence of the public from which it cannot be removed. It has proven itself not only an educator of its individual members, but of the public as well. Through its efforts it has materially advanced its own interests and usefulness, and has largely contributed to the progress of sanitary science in general. There is no other organization extant which comes so directly and immediately in contact with the public in the matter of promotion of health, and the protection of the home from the debilitating influences of its own pollutions. This service rendered by the plumbers is becoming better understood, and its great importance more widely recognized; and in this the advantage of a membership in the association is clearly observable. In union there is not only strength, but advancement, elevation, and the gain of public esteem.

A MISLEADING TEST.

The *Druggists' Circular* corrects an error in regard to testing the purity of water, which, if uncorrected, might be the cause of much mischief. It says:

Among the scraps of erroneous information, which appear in scientific journals with more or less regularity, is one about testing the purity of water by the addition of a little pure sugar. It is said that when water is so treated, any organic matter present is, after a time, discovered in the form of black specks floating in the liquid.

This scrap is on its rounds again, having possibly made a transatlantic journey since its last appearance here, and the method referred to is now credited to a professor in a Western university.

The truth about the matter, as has before been stated in this journal, is that the test referred to was originally proposed by Heisch for the detection of a fungus supposed to be peculiar to sewage. Pure sugar was added to the suspected water in the proportion of about half a gram to 100 cubic centimeters in a stoppered bottle, and the bottle, being placed in a strong light, was kept at a temperature of 80 deg. F. for several hours. It was then examined for the fungus, which if present was disclosed as a distinct turbidity to the naked eye, and under a power of 250 diameters was found to consist of small spherical cells. Heisch believed that the cells thus developed were distinct evidences that the water was contaminated with sewage, but Frankland showed that the spores of this particular fnngus were present in all waters that had been exposed even momentarily to the air, and that their development was due simply to the presence of phosphates in the water. The addition of even a minute trace of any phosphate was sufficient to develop in any water under the conditions above stated.

From this it will easily be seen that the so-called sugar test is not only of no value for the purpose for which it was recommended, but is positively misleading, and consequently dangerous. It ought to be well understood that there is no "handy" test for the purity of water. It is sometimes easy enough to show very promptly that a given water is unfit for drinking, but to make sure of its safety is quite another matter.

It is very evident that the dissemination of misinformation on such a subject is calculated to do much harm, and those who are concerned with preserving health should not fail to show, whenever opportunity offers, the danger of forming conclusions as to the purity of water by "popular" or easy tests.

NOTES AND NEWS.

A medical journal estimates that during its seven weeks' prevalence in the United States the grip killed 12,000 people.

It is said that the population of the world one hundred years hence, will be 6,000,000,000 or over 207 to the square mile, provided the increase continues at the same ratio as in the past 50 years.

There are 600,000 miles of telegraph lines in the world, of which 323,273 are credited to Europe, 176,264 to America, 50,375 to Asia and 112,701 to sub-marine cables.

The lumber trade of New York for the past year is said to have amounted to 1,600,000,000 feet, of which 650,000,000 was received by rail.

A special committee of aldermen has been appointed in Boston to find out what action is necessary to limit the height of buildings. A law passed some years ago for such limitation was put aside by the courts, the judge holding that a title to land was not limited to any depth or heighth.

Baron Liebig says that "brandy, in its action on the nerves, is like a bill of exchange drawn on the strength of the laborer, whieh, for lack of cash to pay it, must be constantly renewed. The workman consumes his principal instead of interest,—hence the inevitable bankruptcy of the body."

Paper tough as wood is said now to be made by mixing chloride of zinc with the pulp in the course of manufacture. It has been found that the greater the degree of concentration of the zinc solution, the greater will be the toughness of the paper. It can be used for making gas pipes, boxes, combs, for roofing, and even, it is added, for making boats.

Systems for distributing power in cities from a central station are coming more into use every day. Steam, electricity and compressed air are the common agents, but Paris has a system which is the reverse of that employing compressed air. The motors operate by a vacuum created by immense air pumps at the central station. The cost per horse per hour is 23 cents, about the same as with the ordinary gas engine when illuminating gas is used.

The new velvet calf leather is attracting considerable attention, and has met with a very favorable reception at the hands of the leading dressmakers and ladies' tailors both in London and Paris. It is as soft as kid, and while presenting a velvety or plush-like appearance, its durability is unquestionable. It is also practically water proof, and is therefore admirably adapted for ladies' shooting costumes, as well as for ordinary outdoor wear.

"The proper way to brush the hair," says a well-known hair dresser, "is not to brush it lengthwise, but to hold the ends of the hair, if it is long enough, and simply scrub the scalp with the brush. This process promotes the circulation of the blood and excites the oil glands to action. After the hair has been thoroughly brushed in this way, it should be then finished with a few vigorous strokes lengthwise of the hair."—*Ex.*

I would note one fact in reference to food; namely, that warm food of all kinds is more digestible than cold. I have been told by patients many a time that they cannot understand why they suffered so much from indigestion at bed-time, for they had only taken a little cold beef and cold rice pudding for supper. The fibres of a bit of cold beef are compact, and the cold milk of a rice pudding to many persons is as solid and indigestible as cheese.—*Dr. E. B. Shuldham.*

The practice of cremation in place of ordinary burial is making steady progress in Paris, in spite of the opposition to it which exists in certain quarters. At the new crematorium of the cemetery "Pere-la-chaise," a furnace is in operation which will reduce a body to ashes in less than an hour, at a cost of about thirty cents for fuel. Since the establishment of this system in the French capital twelve hundred unclaimed bodies of persons who have died in hospitals have been thus disposed of, besides the bodies of three hundred of the well-to-do classes, whose wishes have been thus complied with.—*Popular Science Monthly.*

The *Electrical Review* says: "One of the electrical projects in the air at the present time is the problem of heating dwelling houses electrically, without the use of any very hot substance. It is claimed that wall paper can be made in such a way that the passage of currents of low electromotive force will heat it moderately warm to the touch, and thus diffuse throughout the room an agreeable temperature. This is, of course, theoretically possible, and may even become feasible in a more improved state of the art. A source of warmth coming from the entire surface of the room would certainly be the perfection of house heating. Why may not the artificial illumination of the future be of the same nature? Recent developments are tending towards the possibility of infinite sub-division. The charm of a room illuminated with myriads of candles is one never to be forgotten, though it is one which few of the present generation have seen. We predict that the ultimate use of the glow lamp for domestic purposes will be to diminish its size and increase its number."

Drs. Unna and Beiersdorff recommend that pills coated with keratin, or capsules made of this substance, should be employed when drugs are prescribed which irritate the gastric mucus membrane, and the administration of which is liable to induce vomiting—such as preparations of digitalis and squills, salicylic acid, or iodide of iron; also when substances are given which neutralize the acidity of the stomach, or which in any way impair its activity—such as acetate of lead, tannin, nitrate of silver, alkalis, etc. An outer coating of keratin is also desirable when prescribing drugs that are required to act on the intestinal mucous membrane without affecting that of the stomach, such as extract of logwood, tannin, or the salts of aluminium. Finally, keratin is most valuable when substances are given with the object of destroying worms, but which if introduced in the ordinary way in the stomach undergo absorption to such an extent that they are liable to set up alarming symptoms, while at the same time their germicidal action is reduced. Keratin is obtained by treating shavings of buffalo horn with ether, alcohol and an acid. Its special property is that it is insoluble in the contents of the stomach, but readily so in those of the intestine after the pancreaatic juice has entered.—*The Lancet.*

One of the radical errors of the labor agitators in their struggle for such rights as they claim, is, that they appear to be oblivious to the rights of any labor save that which is connected with labor unions. While demanding amelioration of their own condition, they set themselves resolutely against the amelioration of the condition of workmen who refuse to join the unions, and oppress and persecute them to an extent that employers would never dream of. And yet, labor is labor, whether it subjects itself to the dictates of arbitrary leaders, or prefers to remain free and not liable to be ordered to quit work and starve at a moment's notice. In fact, organized labor has banded itself as much against independent labor as it has against capital; and it is this which has alienated from it much of that general sympathy which would attend its course if its principles were more generous and more universal in their application.—*Saturday Evening Gazette.*

Prof. Ira O. Baker of Illinois, says: "Mortar may be made practically non-absorbent by the addition of alum and potash soap. One per cent., by weight, of powered alum is added to the dry cement and sand, and thoroughly mixed, and about one per cent. of any potash soap (ordinary soft soap made from wood ashes is very good) is dissolved in the water used to mix the mortar. The alum and soap combine and form compounds of alumina and the fatty acids, which are insoluble in water. These compounds are not acted upon by the carbonic acid of the air, and add considerably to the early strength of the mortar. With lime mortar the alum and soap have a slight disadvantage, in that the compounds which render the mortar impervious to water, also prevent the air from coming in contact with the lime, and consequently prevent the setting of the mortar. On the other hand, the alum and soap compounds add considerably to both the early and ultimate strength of the mortar.

This mixture could be advantageously used in the mortar of outside walls, for masonry in wet places, for pointing mortar,

for the plastering of cellar and basement walls, for lining cisterns, etc. The efficiency of the alum and soap compounds is shown by the fact that the walls of the Croton reservoir in Central Park, New York City, were rendered impervious by simply washing them four times alternately with the alum and the soap solutions. Before being coated, the walls allowed the water to pass freely. Four coatings—two pairs—made a common brick absolutely impervious under a 40 foot head of water. The use of the alum and soap as above would in all cases diminish, and in most cases entirely prevent efflorescence or whitewash, which so frequently disfigures brick walls.

SANITARY BUILDING CONSTRUCTION.

At the Sanitary Institute, recently, Mr. Keith D. Young lectured on "Sanitary Building Construction." The lecturer said this title included everything pertaining to the structure of a house which in any way affected the health of the inmates, and so should deal with the removal of waste matters, the provision of pure air and water, as well as the means to be adopted to keep out cold and wet. The subjects, however, of ventilation and warming, lighting, drainage, water supply and sanitary appliances had been, or were to be, dealt with in other lectures at the Institute, and therefore that evening it remained for them to consider how the structure of a house was to be protected from dampness, whether rising from below or beating against the walls or roof, from hurtful exhalations from the subsoil, and from defects arising from the use of improper or unsuitable materials.

The first consideration must naturally be that of site. The soil upon which a house was built might be productive of unhealthy conditions from several causes. It might be damp, or so porous as to contain a greater or less amount of air which might be contaminated by decaying organic matter present in the earth, or be artificially poluted, as when the natural soil had been excavated and its place supplied by refuse from dust-bins, or the contents of cess-pools, and the like. It was commonly believed that the most porous soils, such as gravel and sand, were the most healthy. To a certain extent this was probably true, but it was also possible for either of these soils to be very unhealthy. Underlying the sand or gravel would almost invariably be found some stratum of dense hard rock, practically impermeable, and the rain which fell on the surface of the earth filtered down through the gravel or sand and found its further progress stopped by the rock beneath. This ground water, as it was called, had its natural outlet in the nearest water-course, and its level was determined by the general conformation of the ground, and was always changing. When the rainfall was heaviest, and the temperature low, the ground-water level was high. In the warm weather, and when the rainfall was least, the level was lowest. When, therefore, the water level receded, its place was immediately occupied by air, which, when the water rose, was forced upwards and expelled at the surface. They thus had two factors to deal with, ground water and ground air.

The dangers attendant upon living on a damp subsoil had been demonstrated in numerous instances, notably by Dr. Bloxall in a Report on the Health of Old and New Swindon. These two towns were situated in close proximity to each other, and inhabited by much the same class of people. Old Swindon was built upon limestone, at a height of about 100 feet above New Swindon. The latter was built upon clay, and liable to floods. Dr. Bloxall found that in the new town, with its damp subsoil, the death rates from measles and diseases of the respiratory organs were far higher than those in the old town. In the same way Dr. Buchanan, in this country, and Dr. Bowditch in the United States, had traced the connection between damp undrained subsoils and the prevalence of lung diseases. A remarkable instance of the unhealthiness of a damp soil was also given by Sir Douglas Galton, in his work on Healthy Dwellings.

To counteract the dangers from ground water and ground air, it was necessary to interpose between the subsoil and the interior of a building a layer of some hard impervious material. In the model by-laws of the Local Government Board, upon which the majority of local building regulations outside the metropolitan area are based, it is provided that "every person who shall erect a new domestic building shall cause the whole ground surface or site of such building to be properly asphalted, or covered with a layer of good cement concrete, rammed solid, at least six inches thick." This clause was good so far as it went, but it did not go far enough. Cement concrete could hardly be regarded as an absolutely impervious material; to thoroughly effect the object in view the whole surface of the concrete should be floated over with a finishing coat of cement and sand in equal proportions, at least three-quarters of an inch thick. It often happened that, upon excavating the ground for the foundations of a building, the soil was found to consist of *debris* of various kinds, the original soil having been at some time or other removed, and the excavation filled in with rubbish. The contents of dust-bins and refuse of all kinds, and of the most offensive nature, commonly were used for this purpose. When this was found to be the case, the whole area so affected should be excavated and the offensive matter removed. The limit of time in which decaying animal or vegetable matter ceases to be dangerous, or, in other words, the period of the process of decay of such matters had been put by Professors Burdon Sanderson and Parks at three years. The by-laws in the model code providing for the removal of refuse of this kind from building sites did not, however, fix any limit of time after which the refuse might be considered innocuous, and clearly, in the case of cesspools, it would be unwise if not impossible to allow of any latitude. Old cesspools, filled with black fœtid soil, were familiar to everyone who had to do with building in London, and their complete removal from the soil under any building was an absolute necessity.

In referring to the walls of a house, the lecturer said they must be protected from the damp which was in the ground, and which, either by capillary attraction crept up from below, or by percolation soaked through the adjacent earth, and from the rain which beats against their outer surfaces. The damp which rises from below must be kept down by means of a damp proof course; either by the old-fashioned but excellent double layer of slates laid in cement or asphalte, or by vitrified stoneware. Care, however, must be exercised in laying down the vitrified stoneware damp course, as in a case which came under his notice at Stockwell, the interstices had been all filled up with mortar by the builders in laying, so that they were absolutely and entirely useless.

In basement storeys it was necessary not only to prevent the damp from rising up from below, but also from penetrating through the brickwork from the ground outside. This could be done in two ways, either by asphalting or cementing the outer face of the brickwork from the footings up to the ground level, or by building a dry area all around the outer walls. In many cases the formation of a dry area would be impossible or impracticable, in which case the outer lining of asphalte or cement would seem the readiest and most effectual method of keeping the wall dry; but curiously enough, this method could not legally be enforced by bye-laws under the Public Health Act.

To meet this the model code contained a clause providing for the insertion of two damp courses with a hollow space in the wall between them. This really formed a sort of dry area within the thickness of the wall itself. This plan was not wholly satisfactory, inasmuch as there was no means provided of draining the cavity, a precaution which in damp soils would certainly become necessary. Of course the cavity could be drained, but it was difficult to see how the sanitary officer could enforce such a precaution.

After describing at length the process of manufacture of bricks in different localities, and the kinds generally in use, the lecturer said that good bricks, wherever they came from, were hard all through, and gave a clear, ringing sound when struck against another, square and regular in shape, and free from lumps or cracks. Lumps of lime were sometimes found in bricks. Such bricks were worthless, as the lime when exposed to moisture slacked and split the brick to pieces. Its power of absorbtion was also a good indication of the quality of a brick. An inferior under-burnt brick will absorb a much larger proportion of water then a well burnt one. But that test must be used with caution, as some bricks of a very high quality were more absorbent than the most inferior kinds. A best malm, for instance, a brick largely used in first-class work for arches, absorbed water

at the rate of 22 per cent. of its weight, while a common grizzle only absorbed 18 per cent.

Mortar should be composed of good lime and clean sharp sand, or other suitable material. The mortar of the speculative builder was frequently wholly innocent of lime and the clean sharp sand was often represented by road sweepings. A simple test by which the presence of lime in mortar could be ascertained was to pour over it a little nitric acid. If there was any lime the nitric acid would immediately unite with it, and a more or less energetic effervescence would take place, according as the lime was present in greater or less quantity. As an ordinary rule mortar should be composed of not more than three parts of sand to one of lime. It was rarely, however, that any gauge other than the time-honored rule of thumb was applied, and the only test, therefore, of the goodness of mortar, beyond the one he had referred to, which the health officer could apply, was its setting power. In exposed positions it was frequently necessary to take special precautions to prevent the rain from driving through the outer walls of a house. This was sought to be accomplished in many ways. Rendering the outside with Portland cement was one method, and if properly done an efficient one. Another method was to build the outer walls in two thicknesses, with an interspace, and to fill in the cavity with asphalte, or some composition such as the hygeian rock. All these processes effectually answered the purpose intended, but they made the wall impervious not only to rain but also to air. Now the amount of air that would pass through a brick wall was very considerable, Even the mortar, which was far more compact and homogeneous than the bricks, was pervious to air to a quite appreciable extent. Therefore movement of air must go on to a considerable degree through the outer walls of a house, and ventilation must be largely helped in this way. To shut out this means of ventilation and to encase the house in a waterproof and air-tight skin, seemed very much as if a man were always to clothe himself in waterproof (and therefore air-proof) garments.

The most efficient way of keeping out driving rain was by means of hollow walls, with an air space between the outer and inner wall. This mode not only kept out the wet, but had the additional advantage of keeping up a more equal temperature inside a house, the air-space acting as a non-conducting medium, preventing loss of heat in winter and excessive heat in summer. In building hollow walls provision must be made for the bonding together of the two walls. This was usually done either by iron ties made for the purpose, or by specially-made bonding bricks.

A most efficient and economical hollow wall was devised by the late Mr. John Taylor, to meet the peculiar difficulties of weather he encountered when building at Birchington. He found that the ordinary hollow wall was quite ineffectual in keeping out the salt-laden rain from the sea. He accordingly fixed within the hollow space a layer of slates, resting with their top edges against the inner wall, and their lower edges in the depression of the copper bonding clips. Each slate, therefore was slightly tilted inwards at the top and overlapped the one below. This proved an economical and effectual system.

In most cases, except where cost was of no consideration, a hollow wall consisted of a 9-in. wall and a 4½ in. wall, with an interspace of 2 in. to 3 in., and as a rule the 4½ in. wall was placed inside. That was, from a structural point of view, an error, as the inner and weaker wall had to carry all the weight of floors and roof. The reason for doing so was chiefly one of appearance, as with a 4½ in. outer wall, unless half-bricks were used to represent headers, the whole face of the wall would show as stretchers. In building a hollow wall, the cavity must be carried round all the angles and up to the sides of all the window and door frames. These latter, when set in a 4½ in. reveal, need to be protected by a strip of sheet lead about 4 in. wide, and projecting 2 in. at each end of the head. The wall immediately under the eves, or where the cavity ends, should be built solid as the efficacy of the hollow space as a non-conducting medium would be impaired if the air within could circulate freely.

Another point to which the lecturer referred was the necessity for preventing rain from soaking down chimney-stacks. This was frequently done by building in slate or lead slips just above the eve of the roof, and which projected sufficiently to throw the water off on to the slates. The top courses for at least 12 in. should always be built in cement. The materials in common use for roof coverings were slates, tiles, lead and zinc. Of these the first-named are by far the most extensively used. The test of a good slate was its texture and its power of absorbing water. A good slate should be of close and even texture, and should give a hard metallic ring when struck. It should not splinter when trimmed or holed, and the edges should be hard and not friable. A rough test for absorption was to immerse a slate into water, when if the water in the slate did not risea bove the water-line in the pail in which it was dipped, it might be regarded as sufficiently non-absorbent.

Wherever the local by-laws sanctioned the plan of not carrying the party walls above the roof, slates should be bedded down solid on the top of the brickwork of the party wall. This was a necessary precaution against the spread of fire.

Lead was used in better-class buildings for gutters and flats, and for flashings, ridges and hips. If well laid it was a satisfactory and lasting material. It was subject to expansion and contraction with variations of temperature, and therefore always laid in such a way that it gave without difficulty. The joints between the different lengths were made by lapping one sheet into another over wooden rolls, and care must be taken not to make the sheets too wide.

Zinc was a material which, if the best and laid in the most perfect way, made a most durable roof covering. The zinc of the Vielle Montagne Company was the best to be had, and was made in sheets 7 feet long, 2 ft. 8 in. and 3 ft. wide. It should be laid without nails or solder, so that it was free to expand and contract, and care should be taken to prevent it coming in contact when wet with other metals, such as lead, copper or iron. When this happened galvanic action was set up, and the zinc destroyed.

Rain-water pipes which carry the water from the gutters or roof should always be fixed clear of the wall. An additional advantage was, that when a pipe was fixed in this way it could be painted all round.

Of internal constructive work the most important was floors. For a basement floor there was no better covering for a room where warmth to the feet was desired than wood blocks laid on concrete, in some form of mastic or pitch. As a matter of practice he had found that blocks which were grooved at the sides to form a key for the mastic, if made of well-seasoned wood and laid well, formed a durable and solid floor. Such a floor afforded no harbor for vermin, was washable, and also warm to the feet.

Floors which were laid upon wooden joists and had ceilings beneath them, ought always to have the joists closed either with iron tongues or wooden fillets, to prevent dust and dirt falling through the joists and accumulating on the upper surface of the lath and plaster below.

APPLICATION OF IRON AND STEEL TO BUILDINGS.*

The results of many experiments show that two tons load per superficial foot of foundation is a safe limit to assume for ordinary clay, gravel, etc. Having settled on a limit of pressure on the earth, we will now consider the question of an isolated column as being the simplest case, and will assume that it carries a not unusual load of 50 tons; such a column would weigh about 15 cwt., say one ton; thus 51 tons will be discharged on its bed-stone. This bed-stone may be taken as ordinary sandstone, which would carry with safety a load of 25 tons per foot; this determines the size of base flange of column, which in this case should have an area of two feet at least. In a building where the ground-floor supports are principally columns, and especially for a corner shop where there is only a party and back wall, it is advisable to make the column or stanchion bases larger than given by above rule, to give lateral steadiness to the building. The concrete block under the bed-stone or base-plate or brick pier should always be mixed with Portland cement; for the ordinary lime concrete is long in setting, and in large masses it will take years before the center of block becomes hard. One of Portland cement to eight of other ingredients, if carefully and well mixed, will safely bear a load of five tons per superficial foot. These other ingredients should be

* Extract from a paper read before the Royal Institute of British Architects, by F. T. Reade, Hon. Asso., R. I. B. A.—*Architect and Contractor.*

hard materials, as gravel, broken stone and bricks, or bats of hard quality.

A cast-iron hollow column to carry fifty tons should have a ratio of about fifteen to twenty times its diameter for its length; this might safely be loaded to 2½ tons per square inch of sectional area; and, if we assume a diameter of nine inches and a thickness of metal of one inch, we get an area of 25 inches—20 per cent. in excess of our requirements; but for hollow columns it is always advisable to have a liberal margin of safety, as, unless great care is taken in the moulding, the shifting of the cone may cause an unequal thickness of metal in the casting. The hollow column is, theoretically, the strongest form of section, but the probability of an unequal thickness of metal is an objection to its use. Another objection is that it does not lend itself very readily to being cased in a fire-proof material. Its base flange should have a bold rounding at its junction with the shaft, and bracketed in four directions; the thickness of the base flange should be from one-eighth to one-quarter more than the thickness of the shaft—in this case 1¼ inch. It will often be found that stanchions of the -|- or **H** section are preferable.

It is not now uncommon to use stanchions made of rolled joists, the cap and base-plate being fixed to the joists by angle-irons or gusset-plates, or both combined. As the ends of joists cannot be considered as being accurately at the end plates, without special care in the workmanship, such gussets and angles must be designed so that the shearing or bearing resistance of the riveting alone is sufficient to transmit the load to the base flange. For very heavy loads, say 150 to 300 tons, it is usual to make stanchions of wrought-iron, or tubular section, with web plates and angle-iron, or with webs made of rolled joists or channel irons. The construction of such stanchions presents many special difficulties of design in the cap and base junctions; and as such loads rarely occur in ordinary practice, it is advisable, whenever they do occur, that an engineer should be employed to design them.

Cast-iron girders are now so rarely used that it will not be necessary to devote much time to their consideration; they should never be used for great or variable loads, and their proportion of depth to span should rarely be less than 1-12. They may be used with advantage for carrying window-backs between cast-iron stanchions in light areas in interior of buildings, or in fronts which are constructed of iron stanchions and very little brick-work. In such cases their span should rarely exceed 10 to 12 feet, and their load would only be one 9-inch window-back, and half a bay of wooden or concrete floor—probably not exceeding a total of six tons distributed.

For practical reasons, it would be unsafe to have much difference in the thickness of metal, and it would not be advisable to make top flange less than ¾ foot thick, the web to taper downwards. Thus, supposing the bottom flange was one inch thick, web might be ⅞ inch at bottom and ¾ inch at top, with bold corners or mouldings in angles where joining top and bottom flanges; vertical ribs or stiffeners should be put between top and bottom flanges about 36 inches apart, and, as the material gives facilities for treating these ornamentally, they can be moulded on the face and at ends. The ends of the girder can be easily cast so as to make a neatly-fitting junction with the stanchion, and in a way almost impossible to treat in wrought-iron.

In considering the question of wrought-iron girders, it will be best to begin with the simplest forms, which may be taken to be rolled-iron joists. Lists of their seetions and safe loads must be in the hands of most of the members of this institute, but your attention should be directed to the variation in the amounts of the safe loads given in these lists by manufacturers and dealers in rolled joists. They very rarely give the limit of stress per inch on which such sections are calculated, and this accounts for the discrepancies which have doubtless been noticed between different lists, in which joists of identical sections have safe loads appended to them which in some cases vary nearly 25 per cent., the reason being that the smaller load has been calculated for a stress limit of five tons per inch, while those showing heavier loads have been taken on a limit of 6 or 6½ tons per inch.

A new hospital is being planned for Chattanooga. A company has been formed of sufficient strength to assure its erection and equipment with all the modern appliances for the comfort of patients and quick and easy manipulation of the surgeons. In connection with the hospital will be a medical college.

WATER-WORKS AND SEWERAGE FOR SMALL TOWNS AND VILLAGES.*

[Concluded from Page 40.]

The order of desirability of different classes of water-works is as follows:

1. Gravity works with at least eighty feet head.
2. Pumping works with reservoir.
3. Pumping works with stand-pipe.
4. Pumping direct into main.
5. Steam fire engines, with large main on the principal street kept filled from adjacent stream or river, with suitable hydrants.
6. Steam fire engine, with cisterns.
7. Steam fire engine, depending on wells.
8. Hand fire engine, depending on wells and cisterns.

The last four are hardly properly termed "water-works," but are simply a fire protection. They may often become a positive damage to a town, if they so lull the energy of the community into a sense of false security that they never stop to think of their unsanitary surroundings till the grim messenger of death stalks into their midst. People sometimes wonder at the ways of Providence, never thinking that the laws of health have been rudely trampled under foot. It should be said to the credit of the medical fraternity that the public has always good warning from them, though it often passes unheeded.

In order to determine the magnitude or size of the plant required for both water and sewerage, it is first necessary to ascertain the number of present inhabitants, the probable increase for, say, twenty years in the future, the present and probable demand of manufacturing establishments, and the length of mains required to furnish adequate fire protection. I shall assume that no large use of water for manufacturing will be required, for the reason that large manufacturing uses or demands always bring suitably large plants into existence, as commercial necessities.

In all villages under, say, 2,000 inhabitants, a daily allowance of fifty gallons per capita for all uses, domestic, sewerage, manufacturing and fires, is ample. This doubled, would provide ordinarily for the prospective increase for, say, twenty years. In fact, 100 gallons per capita may safely be taken as the basis of water supply in most towns of 2,000 inhabitants or less, providing for twenty years' consumption without seeking additional supply. Prof. Rankine, of England, subdivides the per capita use in small villages as follows:

Domestic uses, average	10 gallons per day.
Extinguishing fires	3 gallons per day.
Manufacturing uses	7 gallons per day.
Waste	2 gallons per day.
Making a total of	22 gallons per capita.

The American use is in excess of these figures. The use for fire purposes is usually taken at from one-tenth to one-twentieth of the whole supply, for the reason that fires are not an article of "steady diet," and should, of course, be as infrequent as possible for the well-being of any town. Fire protection of necessity requires a larger system of mains and a larger present supply in sight than all the other uses combined; and yet it is always to be hoped it will be seldom used. Efficient fire protection appeals at once to the pocket, and ordinarily is the main consideration which starts up all towns to the need of water supply.

Take an ordinary town of 2,000 inhabitants. There are usually about 400 dwellings and business places, scattered over a territory of, say, four miles of streets and roads. This is on the census basis of five inhabitants to each building in a place. The minimum fire stream, in order to be effective through a 1¼-inch nozzle, must throw at least forty feet high. This requires a pressure at the nozzle of eighteen pounds to the square inch, and will discharge 130 gallons per minute. If it throws eighty feet vertically through a 1¼-inch nozzle, it requires forty pound pressure at the nozzle and delivers 190 gallons per minute. Again, if it throws 100 feet high, it needs fifty-three pounds pressure and discharges 218 gallons per minute. The water must be delivered to the nozzle through a hose from either hydrant or fire engine which is more or less remote from the fire. If the hydrant or engine is

*By Stephen E. Babcock, civil and hydraulic engineer, chief engineer of water-works, Little Falls, N. Y. From the Fireman's Manual, published by the Agricultural Insurance Company.—*Water and Fire.*

100 feet distant, that is, if the water passes through 100 feet of hose, for eighteen pounds effective at the nozzle, then six pounds more pressure must be added for friction in the hose for this distance; if 200 feet of hose are used, then eleven pounds more pressure must be added; if 300 feet of hose, seventeen pounds more, making a total pressure of thirty-five pounds required at the hydrant or steamer to raise a 1¼-inch stream forty feet high, delivering 130 gallons per minute through 300 feet of hose. This pressure is equivalent to eighty feet head or elevation of stand-pipe or reservoir. That is, this is the lowest limit at which it is desirable to locate the elevation of a stand-pipe or reservoir, and 300 feet is the greatest distance which hose should be laid to produce this result. Allowing for bends and turns, hydrants 500 feet apart would therefore seem to be the lowest limit of effectiveness under the minimum head assumed.

To illustrate: If the hose was laid 600 feet from a steamer or hydrant showing thirty-five pounds pressure, the effective head of the nozzle would only be twelve pounds, and would throw only twenty-seven feet vertically, and would discharge only 104 gallons per minute. Again, through 900 feet of hose the stream would be practically valueless, Let me state it in another way. To maintain eighteen pounds pressure at the nozzle through 600 feet of hose would require fifty two pounds pressure at the hydrant or steamer, or seventy pounds through 900 feet of hose.

The next point is to determine the minimum capacity of main and of the reservoir required for fire protection. The law of chances now comes in. The only guide is a sort of "rule of thumb." It is fairly safe to assume that not more than two fires will occur at one and the same time, although it is better to assume that burning cinders in a high wind may carry or transfer the fire, once under headway, to, say, two other places, making three fires in all. Now, assuming two hose streams in use at each fire, we should call for 780 gallons, or say ten cubic feet per minute. Four-inch cast iron pipe is now the smallest pipe used in water-works systems. During the progress of a fire in a small village the domestic and other consumption would be at a minimum, or at the utmost not over two cubic feet per minute for the length of time the fire is in progress. To pass twelve cubic feet per minute through a four-inch pipe would involve a loss of head of seven feet, or three pounds for every 1,000 feet of four-inch pipe through which the water flows; while through a six-inch pipe the loss is only 1,643 feet, or 0.65 pounds per 1,000 feet to pass seventeen cubic feet per minute. Thirty cubic feet per minute will pass through 1,000 feet of eight-ineh pipe with only a loss of 0.50 pounds, or 1,221 feet; and a ten-inch pipe will discharge sixty cubic feet per minute through 1,000 feet, with a loss of one and one-half feet head, or 0.60 pounds. Assuming that eighty feet head is all that can be made available, it follows that at least eight-inch pipe should lead from the reservoir to the village street, and, if far distant, ten or twelve-inch pipe, with street mains of at least six inches diameter, and short connections of four-inch. It is also apparent that where a village is so small that only one fire at a time need be provided for, a four-inch main is ample, although it is best to use a six-inch or eight-inch for any great length of main leading from the reservoir.

The next problem is to determine the least capacity of the reservoir or stand-pipe. If pumping to a stand-pipe is resorted to, it is safe to assume that in case of fire at least one-half an hour will be consumed in starting up the fire and increasing the pressure. Again, any fire that is attacked in its incipiency rarely lasts over an hour. The stand-pipe will therefore require to hold (assuming three fires) at least 27,000 gallons, and to be located at an elevation above the limit of eighty-foot head. Assuming the stand-pipe to be drawn down six feet, then its diameter must not be less than eight feet, but twelve or twenty feet is far better.

Where there is a gravity supply the reservoir should not be less than forty feet square, and eight .or ten feet deep, holding at a minimum 90,000 to 100,000 gallons of water. These are the minimum figures. It is apparent that a reservoir with 100, 150, 200 or 250 feet head is much more desirable. A reservoir of 100 feet head gives forty-four pounds pressure, while 150 feet head runs up to sixty-five pounds; 200 feet to eighty-seven pounds; 250 feet to 108 pounds. Hydrants should be designed to provide at least one hose and one steamer connection. Two hose and one steamer are better. The utility of a steamer connection on hydrant is two-fold. A fire steamer may be connected up to increase the pressure; hence, height and quantity of stream. In minimum pressure, gravity system, an increased pressure and height from nozzle may be obtained by using two siamese connections and two lines of hose. In this case one siamese should be screwed to the hydrant-steamer connection, so that two lines of hose may be attached to it; it should also be connected back at the end of line of hose by another siamese connection to one discharging stream or nozzle. The loss of head in the hose is thus reduced over one-half. The same plan holds true to increase the effectiveness of a fire engine on long lines of hose.

The sewerage system next demands attention. What is known as the "separate system" is the only desirable plan for small villages. The ordinary surface and street water is usually well cared for by gutters and drains. It is folly for a small town to incur the extra expense necessary to provide a combined system, *i. e.*, house drainage and surface water. The pipes for a separate system should run from eight to twelve inches in diameter, with perhaps fifteen or eighteen inch diameter of outlet. I prefer these to be salt-glazed, vitrified pipe. All junctions of sewers should be at manholes, and each main line should be provided with an automatic, timed flush-tank at its head, discharging from 400 to 600 gallons in about four seconds, taking twenty-four hours to fill the tank.

The cost of water-works for small villages and towns, including sewerage, is relatively much less than for large cities or manufacturing towns. Villages of 2,000 people or under require an available supply of only 200,000 gallons per diem or less, while a manufacturing town or city may require two, three, four, ten, twenty or two hundred million gallons. New York City requires 250,000,000 gallons. Two hundred and fifty thousand gallons per diem is only eighteen cubic feet per minute, or less than a wagon load of water per minute, and small streams, or even springs, of this magnitude are common everywhere. Suitable streams that will furnish two, three or four million gallons or upwards are scarce, and are often located at a great distance from a town. A small village does not require any such amount. Should water-works give it an impetus and manufacturing be introduced, then commercial needs will quickly provide a larger and more expensive plant.

Take a case in point. The village of Little Falls, N. Y., is a manufacturing town. Water is a commercial necessity for its advancement. The town, therefore, has provided a large supply, or 4,000,000 gallons per diem. This necessitated going some nine miles into the country, and it became necessary also to provide a system of distribution pipes large in diameter. The cost was $300,000, and the town contains only 10,000 inhabitants. Thus it has a daily supply of 400 gallons per capita. This system was mostly in rock, however, and therefore it was more expensive than the average. Its next neighbor on the west, the village of Herkimer, with a population of 140,000, provided only a domestic plant of 500,000 gallons daily capacity, and costing only $56,000, with no rock in the excavation. Yet the Little Falls system is relatively the cheaper, as eight times more water is provided, and the water-works cost only six times as much. The large system in Little Falls was the best economy for that town, because of its manufactures, one factory paying over $1,100 per annum, at three cents per 1000 gallons, and so for Herkimer its domestic plant was all that the needs of the town required, and was doubtless the cheapest for that town.

Taking the statistics of the actual cost of plants for villages of 2.000 inhabitants or under, the average cost is approximately about $5,000 to $6,000 per mile of pipe laid, while a separate system of sewerage for the same town, if laid at the same time the water-works are put in, will vary from $2,000 to $3,000 per mile. Take the case of an ordinary village of 1,000 inhabitants, the length of water pipe is usually about three miles, or $18,000, while the sewerage will cost, say, $9,000, or a total of $27,000. The fire and sanitary savings in twenty years exceed $34,820, and often amount to more than double the cost of the plant.

I have given these general statements in the hope that they may lead to such an investigation ot the subject by the citizens of the smaller towns and villages, and so help to educate public sentiment that they shall recognize the economy and necessity of water and sewerage systems.

Finally, I would suggest that it would be well for each small town not already provided with water and sewerage to appoint a committee of its leading citizens to thoroughly examine the relative merits of each and every source of available water supply, and as soon as these foundation facts are obtained call in some competent hydraulic engineer, state all the merits and demerits of each source, and be guided by his skill and judgment in determining the proper system to be adopted.

REVIEWS AND NOTES.

"Hygiene and Public Health," by Louis C. Parkes, M. D., D. P. H., London University (Philadelphia: P. Blakiston, Son & Co.; Chicago: A. C. McClurg & Co.) Cloth, $2.50. This is a valuable contribution to the literature of public health and sanitary science as understood to-day. This is a work that will find a demand and a place unfilled. It is a study in the right direction, and furnishes information on subjects of direct and practical interest not only to the student or man of science, but to all. It is elementary enough to be taken up and understood by the beginner, and elaborate enough to be of great service to advanced students, teachers and public health officials. While the book is not intended to be exhaustive of any of the subjects treated, it is full enough to convey much more than preliminary instruction, and to form a broad and solid basis on which to establish the principles and practices of the great science of which it treats. It is plain and practical, and where, by necessity, it is at all technical, the subjects are so clearly presented, the language so beautifully selected, that those who have not been given a scientific education can easily comprehend it. The subjects treated cover the entire field, and the most important features of each are concisely, clearly and entertainingly presented. The work is not a dry scientific discourse, but the happy style of the author has made it interesting, and as entertaining as it is full of instruction. Where it is necessary to make a principle more easily and fully understood, illustrations are used, which add to the charm and value of the book. The work is now in its second edition, the first having been exhausted within six months of its issue, a recommendation strongly in its favor.

In the ninth annual report of the Board of Health of Detroit, Mich., some important subjects are discussed by Samuel P. Duffield, Ph. D., M. D., health officer of the city. "Diphtheria vs. Disinfection," in which the investigations of Dr. Prudden are discussed, is of much interest, and the conclusion is that diphtheria, as found in the human being, cannot be artificially produced in animals, or, more strictly, it has not yet been so produced; and that cases reported as occurring from animals were communicated not by the disease in the animal, but by germs which it carried. Experiments have also led to the conclusion that disinfection by the fumes of sulphurous acid is a failure, and steam is strongly recommended.

At the recent meeting of the Michigan State Board of Health the subject of consumption in schools was discussed, and the following preamble and resolution adopted:

WHEREAS, The indoor confinement and the severe competitive work of the school-room tend to render recovery of health by consumptive pupils impossible; and,

WHEREAS, Except consumptives exercise great care with their sputu, and except the ventilation is such as to cause all dust to pass out of the room near the floor level, the presence of consumptives in the school room may endanger the health and lives of their fellow pupils.

Resolved, That, in the opinion of this board, any pupil or person known to be affected with pulmonary consumption should be excluded from all public schools, colleges and other institutions of learning until such pupil or person is so far recovered from consumption that no cough or expectoration occurs.

Dr. Baker presented a table and an illustrative diagram exhibiting the epidemic-waves of diphtheria in England during the period 1855–1888, inclusive. The part representing the period, 1855–1881, was published in the proceedings of the sanitary convention held at Reed City in April, 1883; but Dr. Baker has now extended the statistics and the diagram to 1888, and has associated with it evidence as to the change which has taken place in the age of decedents from diphtheria in England.

"Malaria and the Causation of Intermittent Fever," a paper read by Henry B. Baker, M. D., at the meeting of the American Medical Association, Nashville, Tenn., last May, is now published in pamphlet form, the receipt of a copy of which we are glad to acknowledge.

"World's Fairs, from London, 1851, to Chicago, 1893," by C. B. Norton, has been duly received. The publication is interesting and timely. It evidences extensive and careful research and patient compilation. The illustrations and information contained in the book will be found pleasing and instructive, and are of special interest at this particular time, and we hope something will be found in it to harmonize the efforts and views of the Commission and Directory and get them down to business.

The *N. W. Builder* has issued an offer of premiums for which they desire photographs of residences, and will pay a premium of $25 to the one ranking highest in architectural merit of exterior, under each of the following heads.

1st. Residences costing $4,000 or less.
2nd. Residences costing between $4,000 and $8,000.
3rd. Residences costing between $8,000 and $15,000.
4th. Residences costing between $15,000 and $30,000.
5th. Residences regardless of cost, as explained below.

Write for particulars to the N. W. Builder Publishing Co., St. Paul, Minn.

AMONG THE PLUMBERS.

The J. J. Burns Manufacturing Company is a new firm just started at 128 and 130 South Clinton street. This firm succeeds the Eder Brothers.

Mr. M. O'Donnell, of Dubuque, Iowa, spent Thanksgiving in the city among his many friends. Mr. O'Donnell was formerly a Chicago plumber, and did some of the plumbing work in the Auditorium building. He reports business good in his adopted city.

James McDonald has opened a plumbing shop at 556 West Van Buren street, Chicago.

G. G. Bates, of New York City, has removed his plumbing shop to the corner of Third avenue and 115th street.

Robert Griffith and J. F. Mathews recently took a hunting trip to Fox Lake.

A. W. Murray says that he will be any one's grandpa who will drive away his rheumatism. He reports business good on the West. Side.

The following is a Thanksgiving story found in the Chicago *Tribune:*

The two passengers were whiling away the time by a game of cards in the smoking-car.

"Want to bet on your hand?" said the one with the diamond breastpin casually.

"I don't object," answered the other, lighting a fifty-cent cigar, "but I warn you that when I start in a game the limit's off."

"That suits me. I am a retired plumber."

"And I am a retired paper-hanger."

There wasn't any betting done on that game.

The master plumbers of Boston held a grand reception on Thanksgiving evening in the Elks building. Good music and feasting were the order of the evening. After a sumptuous repast the delegates to the Denver convention of master plumbers were called upon to give their experiences while in the Rockies.

President Robert Griffith did not forget those less fortunate than himself on Thanksgiving day, and sent his wagon loaded with good things among the poor families in his neighborhood.

Chief Inspector Young's remark that sanitation had become a household word is certainly true when the subject of plumbing is given considerable attention in the pulpit. Dr. Crow, of Newark, N. J., who recently preached in the People's church of Chicago, devoted considerable time to the subject of plumbing. Mr. Young is making great strides every day to make the people of Chicago realize the importance of observing sanitary rules and regulations. Several plumbers have been compelled to recognize the power of the Health Department, to the tune of $110 for each offense. A first-class plumber cannot afford to be negligent in observing the rules of the department, for, besides the actual loss

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of dollars and cents when caught, there is a loss of customers. This kind of notoriety will kill a good business within a few years.

James Gaffney, of Tacoma, Wash., has been appointed plumbing inspector of that city.

J. J. Wade had rather a close call on Tuesday morning while superintending his plumbing work at the Bell-Conrad building. Mr. Wade was standing near the building talking with his nephew, Thomas Wade, when a sharp piece of timber fell from an upper story, striking between the two men. No injury was sustained by either party, but Mr. Thomas Wade lost a part of the toe of his boot.

Justice Bradwell fined the following firms and business houses this week $50 and costs for violation of the smoke ordinance: William Jenkinson, Cereal Milling Company, J. F. Mathews, L. Z. Leiter (on two charges), Chicago Opera House Company, Saratoga Hotel, Lartz Wall Paper Company, Wellington Hotel, A. H. Revell & Co., Louis Palm, Ware-Craig Manufacturing Company, S. A. Maxwell & Co., Charles Lynch, Moore Bros., Tobey Furniture Company, W. C. Ritchie, and the Chicago Arc Light and Power Company.

The firm of Herzog & Mertz, at 2230 Archer avenue, were fined $110 and had their license suspended this week for not reporting some plumbing work to the Health Department. The ordinance requires that plumbing work shall be reported before it is covered up, in order that the department may properly inspect its workmanship. The plumbers should begin to realize that it is a great deal easier to have their work reported than to skirmish around to raise $110 with which to pay a fine.

Captain James E. Boyle, of Brooklyn, N. Y., died on Nov. 25th, in his 56th year. Mr. Boyle was well-known among the plumbers of the country, and was connected for a long time with the firm of Henry Huber & Co.

Martin Moylan has had a rough time with the pleurisy recently. It was necessary to have a very difficult surgical operation performed, but Mr. Moylan is now rapidly recovering.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Salt Lake City, Utah: Adler & Sullivan, of Chicago, have plans for the new Ontario hotel and a six-story office building to cost $300,000.——St. Louis, Mo.: A nine-story office building; cost, $500,000. Adler & Sullivan, Chicago, architects.——Seattle, Wash.: Adler & Sullivan, of Chicago, are making plans for a new opera house block to cost $325,000.——Chicago, Ill.: Dearborn avenue and Goethe street, a four-story apartment building; cost, $75,000. J. R. Cady, architect. Flanders & Zimmerman have prepared plans for a two-story residence to be erected at Glencoe; cost, $15,000. They have also planned a $25,000 residence to be erected at the same place. Wabash avenue and Forty-third street, a block of four-story stores and flats; cost, $30,000. Flanders & Zimmerman, architects. Oakenwald avenue, near Forty-fifth street, a brick and stone residence. M. D. Beers, architect. S. S. Beman is preparing plans for twenty-five brick cottages to be erected at Pullman; cost, $50,000. 982 W. Twelfth street, a three-story flat building; cost, $15,000. Frederick Ahlschlager, architect. J. J. Houhn is ready to receive bids on nine stone front residences to be erected in Hyde park; cost, $135,000. Julius Speyer has plans for five two-story residences to be erected on Boulevard place, near Vincennes avenue; cost, $25,000. The same architect is preparing plans for a two-story store and hall to be erected at Montrose. M. Reich will erect a three-story store and flat building on Wentworth avenue near Fifty-ninth street; cost, $22,000. Julius H. Huber has prepared plans for four three-story flat buildings to be erected on Chestnut street; cost, $25,000. D. A. Lapointe is preparing plans for the following buildings: A four-story apartment house to be erected on Warren avenue; cost, $50,000; five two-story flats to be erected on Monroe and Spaulding streets; cost, $20,000; a three-story apartment house on Artesian avenue and Lake street; cost, $16,000; a three-story flat building to be erected on Polk street near Center avenue; cost, $12,000, and a three-story flat building to be erected at 1545 Monroe street; cost, $10,000. Austin avenue and Desplaines street, a four-story store and flat building; cost, $15,000. Fromman & Jebson, architects. L. G. Halberg is making plans for a three-story apartment building to be erected on Washington boulevard, near Western avenue. He is also preparing plans for a three-story apartment house to be erected on Noble avenue. C. V. Arnold has plans for a three-story residence to be erected on Grand boulevard, near Forty-third street, and for a residence to be erected at 4539 Oakenwald avenue.——Brooklyn, N. Y.: Broadway and Madison streets, three four-story brick stores and flats; cost, $30,000. Moores & LeQuesne, architects. Seventeenth street, near Ninth avenue, twelve three-story frame dwellings; cost, $24,000. Charles Hart, owner. Broadway, near Madison street, five four-story brick stores and flats; cost, $50,000. Moores & LeQuesne, architects.——New York City: 134th street, near Seventh avenue, two five-story brick flats; cost, $30.000. B. Fisher, architect. 68 Bayard street a six-story brick shop; cost, $26,000. Herter Bros., architects. 130-132 West Forty-second street, a brick store improvement; cost, $20,000. F. & W. E. Bloodgood, architect. Seventy-sixth street, near Ninth avenue, five four-story brick dwellings; cost, $100,000. A. B. Ogden & Son, architects. Fifty-ninth street and Fifth avenue, a seventeen-story brick hotel; cost, $600,000. W. H. Hume, architect. 105th street, near Second avenue, four five-story brick stores and flats; cost, $76,000. Cleverdon & Putzel, architects. 8-12 Dey street, an eleven-story brick office building; cost, $150,000. H. J. Hardenburgh, architect. 73 Warren street, a six-story brick store building; cost, $40,000. G. A. Schellenger, architect. 117th street and Fifth avenue, four five-story flats. Wm. B. Franke, architect. Eighth avenue, near 118th street, eight five-story flats and stores. A. B. Ogden & Son, architects. 100-102 West Houston street, a six-story stone and iron warehouse; cost, $45,000. Charles Rentz, architect. 101st street, near Manhattan avenue, a five-story brick and stone flat buiiding; cost, $20,000. Richard R. Davis. architect. Corner Henry and Market streets, a six-story brick and stone flat; cost, $40,000. Charles Rentz, architect. Thirty-ninth street and Park avenue, a five-story brick and stone dwelling; cost, $110,000. Renwick, Aspinwall & Russell, architects. Carmine and Bleecker streets, a six-story brick store building; cost, $75,000. Chas. Rentz, architect. 133rd street, near Seventh avenue, a five-story brick flat building; cost, $23,000. Jno. C. Burne, architect. 127th street, near Second avenue, three five-story brick flats; cost, $67,500. Jno. C. Burne, architect. 114th street, near Fifth avenue, seven three-story brick dwellings; cost, $56,000. F. J. Conlon, architect.——Charlotte, N. C.: Architect G. L. Norman, Atlanta, Ga., has prepared plans for a city hall and fire engine house, to be three stories high; cost, $45,000.——Winston, N. C.: Sealed proposals will be received by the West End Hotel and Land Company of Winston, until 12 M., December 1st, for the erection of a large frame hotel, 410 feet front, 60 feet deep, with 100 feet L, four stories high. Plans and specifications may be seen at the office of the company at Winston, N. C., or at the office of the architects, Messrs. Wheelwright & Haven, 6 Beacon street, Boston, Mass.—— Charleston, S. C.: Architects Simons & Huger are preparing plans for improvements to the Episcopal church at Summerville, S. C.——Omaha, Neb.: Architects Cleves Bros. have plans for a bank and office building to be erected on 15th and Douglass streets for Wm. Karbach, to be five-stories high, of pressed brick and stone trimmings, terra cotta; cost, $150,000. The Omaha Brewing Association will commence erecting a brewery, malt houses and vaults at once. The Frederick Krug Brewing Association contemplate erecting a brewery, malt houses and vaults which will cost about $500,000. Architects Deitrich & Guth, Creighton building, have plans for a harness factory to be erected in East Omaha for Marks Bros., Saddlery Company, on Henry street, to be two stories high, built of common brick with stone trimmings. Architects Deitrich & Guth have plans for a bakery to be erected on 30th and Lake streets for Otto Wagner. Two stories, built of common brick with stone foundations. They have also prepared plans for a dwelling for A. B. Slater, to be two stories high, of common brick and frame. Architect I. Hudson, Jr., has plans for stores and flats for Walter Mills, to be two stories high, built of pressed brick with stone trimmings. Architect A. D. Baker has plans for a dwelling for A. L. Meyer, to be two stories, built of brick and frame.——

Woodport, N. J.: Architect George W. Bright, Morristown, N. J., has prepared plans for a hotel for Thos. Bright, Woodport, N. J., to be three stories high.——Washington, D. C.: 734-38 15th st., 3 3-story brick buildings; owner and architect, G. A. Shehan. 1440 N street, 3-story brick building; cost, $7,500; owner, K. B. Krane; architect, J. A. Sibley; builder, J. B. Williamson. Seventh street, a 3-story brick building; cost, $18,000. C. A. Didden, architect. Tenth street, a 3-story brick building; cost, $21,000. L. Dessey, architect.——Wheeling, W. Va.: Corner Fourteenth and Chapline streets, four dwellings; cost, $18,000. M. F. Giesey, architect.——Raleigh, N. C.: It is proposed to erect a $100,000 hotel.——So. Bethlehem, Pa.: The L. V. R. R. office at So. Bethlehem, Pa., will have an additional story of brick and copper.——St. Paul, Minn.: Another arcade building, to cost $100,000 will be built from 7th to 8th streets on 7th street. Walter Ife is the architect.——Worcester, Mass.: Corner Elm and Sever streets, a frame dwelling; cost, $25,000. Fuller and Delano, architects.——Kansas City, Mo.: Plans have been made for a new union depot. Willard E. Winner is interested in the enterprise. ——Paris, Ky.: The Kentucky Midland Railway is to erect a new depot at this place.——Des Moines, Iowa: A new union depot is to be erected in this city, by the Des Moines Union Railway, Wabash, Maple Leaf, Des Moines and Northwestern roads. ——Pekin, Ill.: Extensive shops are to be erected at this place by the Santa Fe road.——Huntington, W. Va.: A new depot is to be erected at this place by the Ohio River Railroad Company. ——Spokane Falls, Wash.: Architect C. B. Seaton has prepared plans for a university, to be built of granite boulders and pressed brick.——Tacoma, Wash.: The First Baptist congregation will sell their property corner of 9th and D streets, and erect a new church. The Northern Pacific Railroad will erect a brick engine house to cost $43,000.——Whatcom, Wash.: The Bellingham Bay National bank will erect a bank building. To be 55x125, three stories, built of brick and terra cotta.——Front Royal, Va.: Superintendent C. A. Macatee will erect a hotel for the Front Royal & Riverton Improvement Company. To be 50x120, four stories high, built of marble and stucco; cost, $25,000. Superintendent S. H. Leicester will erect a piano factory for the Leicester Piano Company, of Detroit, Mich. To be 132x88, three and a half stories high, built of brick; cost, $30,000.— Owosso, Mich.: D. M. Estey will erect a furniture manufactory. To be 250x80, three stories high, built of common brick; cost, $35,000.——Sheffield, Ala.: Architect J. J. Treveres is preparing plans for a club house and armory. It will be 65x90, two stories, and cost $18,000. ——Darby, Pa.: Four brick dwellings are to be erected by Thomas Tarbottom.——Easton, Pa.: An organ factory is to be erected by Jacob Raub.——Elm Station, Pa.: The Baptists of this place are to erect a new church.——Greenville, Miss.: This place is to have a $60,000 court house.——Kansas City, Mo.: The Kansas City Suburban and Belt Line Railway Company has completed plans for a $15,000 storage warehouse, to be built at once. Five other buildings will be erected next spring by the same company.——Macon, Ga.: A $250,000 hotel is to be erected by a stock company.——Mandeville, La.: There is talk by western capitalists of forming a company for the purpose of erecting a hotel at this place, to cost, $100,000.——McKeesport, Pa.: A $25,000 hotel is to be erected here by Mrs. Sarah Savage.——Augusta, Me.: Ex-Governor H. M. Plaisted is to build a magnificent residence.——Northport, Me.: The Northport Hotel Company was recently organized at Bangor to build a hotel at Northport, and plans are being made for a three-story building, 36x80, with two wings, each 42x30. Frank E. Kidder, of Denver, Col., is the architect.——Washington, D. C.: A stone mansion in the old Colonial style of architecture is to be built on 16th street above Florida avenue, for W. W. Durant. The plans were made by J. C. Cady & Co., of New York. The work of construction will be in charge of architect R. I. Fleming, of this city. The house will probably cost $135,000.——Pittsburg, Pa.: Architect J. T. McClarren has drawings for three houses to be erected on Main street; also drawings for a suburban residence for Prof. Curtis, to be built on the Brownsville road. The Baltimore and Ohio has purchased 30 acres at Glenwood for additional ground room and round houses. The Braddock Township School Board will erect upon the property a school building to cost about $25,000.—— Kansas City, Mo.: W. A. Kelly, member of the Board of Public Works, has been awarded the contract, at $68,990, for the erection of the new jail and criminaf court building.——Lebanon, Pa.: D. W. Miller will erect three brick dwellings.——Morrisville, Pa.: Three dwellings are to be erected by Henry Comfort.——St. Louis, Mo.: Washington and Pendleton avenues, two dwellings: total cost, $21,000.——Milwaukee, Wis.: Jefferson and Wisconsin streets, a new hotel; cost, $450,000. H. C. Koch & Co., architects. ——Sioux City, Iowa: Corner Fifth and Douglas streets, a four-story block; cost, $30,000. P. L. Lindenholm, owner.——Thurlow, Pa.: A new school building is to be erected.——Williamstown, Pa.: Several dwellings are to be erected by Dr. Thomas, of Thomas, Bondine & Co.——Woodport, Pa.: A large hotel is to be erected by Thomas Bright.

HEATING AND LIGHTING.

Seattle, Wash.: A committee appointed to investigate street lighting has recommended that bids be solicited for new contracts of all kinds of lights for a term not exceeding one year. Address the City Clerk.——Jonesboro, Ind.: A system of lighting will be established at an outlay of $300,000. Address Arthur L. Conger for details.——Chicago, Ill.: J. McFell is at the head of a new electric company.——Greenville, Ill.: Address C. D. Halles for information concerning the new electric light company.——Aledo, Ill.: The public officials of this place have decided to establish an electric light plant at once. The City Clerk can furnish particulars.——Amesbury, Mass.: A new incandescent machine, with a capacity of 500 lights, is to be added to the plant of the local Electric Light Company.——Woonsocket, Mass.: It is proposed to establish an electric light plant.—— Seattle, Wash.: The Standard Electric Company has been formed with a capital stock of $25,000.——McKeesport, Pa.: Extensive improvements are to be made to the local electric light plant. ——Milton, Pa.: The streets will soon be lighted by electricity. ——Chicago, Ill.: The Morgan Park Electric Company has been incorporated to furnish electric light, power and heat. Capital stock, $25,000. G. S. Wheaton is one of the incorporators. ——Davenport, Ia.: All the bids for public lighting in this city have been rejected and new ones will soon be wanted. Address Mayor Ficke, for particdlars.——Baltimore, Md.: The Donaldson Macrae Electric Company has been organized. Capital stock, $20,000; incorporators, W. W. Donaldson, R. Macrae, and W. Winchester.——Memphis, Tenn.: The Edison General Electric Company, representing $10,000,000 capital, whose general Southern office has been in New Orleans, La., will remove to Memphis.——Monticello, Ill.: The city is to be equipped with the Heisler system of electric lights. A stock company has been organized with a capital of $25,000, with the purpose of supplying the city with electric light.——Hannibal, Mo.: The citizens of this place will soon be called upon to vote upon the proposition to issue bonds to the amount of $20,000 for the purpose of putting in an incandescent light plant.——Columbus, Mo.: An electric lighting plant is to be established.——Berwick, Pa.: An electric light plant is to be established. The president of the Borough Council can furnish particulars.—— Charleston, S. C.: Important improvements and extensions are to be made to the plant of the Charleston Electric Light Company.——Abilene, Tex.: A franchise has just been granted to the Abilene Electric Company, of which Max Elser is at the head. A plant for lighting is to be established at once.——Bristol, R. I.: Improvements are to be made to the plant of the local Electric Light Company.——Muscatine, Iowa: Extensive improvements are projected by the Gas Electric Light and Power Company.—— Shamokin, Pa.: An electric light company has been established. Address the mayor.——Bunkley, La.: The Cumberland Island Co. will construct an electric light plant.——Columbia, S. C.: The Congaree Gas & Electric Company will construct an electric light plant.——Savannah, Ga.: The Brush Electric Light & Power Co. will establish a plant.——Bellefontaine, O.: An Electric Light and Power Company has been organized; capital stock, $100,000.——Louisville, Ky.: The Gooch Electric Light Co. has been organized. The incorporators are W. T. Grant, J. J. Harrison, D. Belknap and others.——Alexander, Va.: The Hubbell Electric Light & Power Co. has been organized; capital stock, $100,000; incorporators are I. Sacks, President, and E. Sutherland, Secretary, both of Washington, D. C.

SEWERAGE NOTES.

South Framingham, Mass.: The sewer committee has been authorized to acquire additional land in connection with the sewerage system.——Brooklyn, N. Y.: The Department of City Works proposes to build a sewer on Second avenue from Forty-sixth street to the city limits.——Columbus, O.: The city engineer is at work on plans for a system of sewerage for the West Side. It contemplates a main sewer on Gift street, but the difficult question is the terminal; either a sewage farm or pumping station must be determined upon. His plans will be in accordance with the system adopted. If a pumping station is agreed upon, it will probably be on the east side of the river, and then the West side sewer would have to cross the river.——Bristol, Conn.: Mr. T. H. McKenzie, Engineer of the Southington Water Co., is preparing plans for the sewerage of Bristol. He recommends the separate system, and disposal of the sewerage by irrigation. The main sewer will be 18 inches in diameter.——Atlanta, Ga.: A sewerage system, to cost $95,000, is projected. For particulars address the Mayor.——East Portland, Ore.: Plans for a system of sewerage are to be prepared by Mr. Rudolph Hering, of New York. There will be some construction in 1891. The city has a population of 10,615. Mr. O. H. Bellinger is City Surveyor.——Houston, Tex.: It is proposed to construct a brick sewer along the line of the city ditch. The cost is estimated at $27,000.——Eugene, Ore.: The city council has adopted a system of sewerage, the cost of which will be about $15,000 Plans have been prepared by Kelley & Hammond.——Albion, N. Y.: The system of sewerage submitted by Dwight M. Waldo, C. E. has been approved by the State Board of Health.——Richmond, Va.: The officers elected by the American Society of Mechanical Engineers at the annual meeting at Richmond are President, Robert W. Hunt of Chicago; vice-president, Stephen W. Baldwin, New York; secretary John F. Parkhurst, Cleveland; treasurer, Alexander Gordon, Hamilton, O. Managers—Andrew Fletcher, New York; W. R. Warner, Clevelaud, and Coleman Sellers, Jr., Philadelphia.——Oakland, Cal.: The residents of West Oakland are making a strong push for better sewerage.——Denver, Col.: Plans have been made for the proposed extension to the Delgany street sewer. They call for 8600 linear feet of brick sewer fifty-three and fifty-eight inches in diameter, extending from Twenty-sixth street down the Platte to the Old Colorado Central Railway bridge near the Grant smelter. The plan will furnish an outlet for the entire sanitary sewerage system of that tract of the city southeast of the river. The present 30-inch sewer on Wewatta street, and the projected Delgany street sewer proper, which will run parallel to the latter along the same street, will connect with the larger main of the extension at Twenty-sixth street. As the part beyond Twenty-sixth street is built, various branch sewers will be taken up and connected with, thus removing the outlet for the entire debris of the city from Twenty-sixth street to the Colorado Central bridge. The mains that will connect with the proposed extensions are: The 15-inch main from the Thirty-first district, which comes in at Twenty-sixth street; a 15-inch from the same district at Thirty-first street, and the 32-inch main of the Downing avenue sewer, which comes in at Thirty-sixth street.——Chico, Cal.: The Board of Trustees have had plans, specifications and detail drawings prepared by Messrs. Shepard & Teilman, of Fresno, Cal., and are now negotiating for the right of way, six miles, from the city limits to the dumping ground. The proposed system is practically the Memphis system, conveying the sewage through salt glazed vitrified sewer pipe, of 12, 14 and 16 inches in diameter. The estimates are in round numbers $60,000 for main, and such lateral sewers as it is proposed to put in under the plans. The bond election will be called within the next two months. Address J.——D. Sproul.——Fostoria, O.; The Sewer Commission has about completed its preliminary work, and at a recent meeting adopted plans and specifications prepared by G. D. Hersey. The system as proposed provides for both sewerage and drainage, and will be paid for b ythe taxpayers in general instead of on the assessment plan. The Council will be asked to provide funds to the amount of $90,000 to carry out the plans. It will be necessary to sell bonds to raise the money, and Council will take prompt steps to meet the emergency. The plans provide for the main sewers to be of brick, 44 inches in diameter, with ten miles of laterals.——Puyallup, Wash.: It is probable that the projected sewerage system from this city will be established, at an estimated cost of $27,000. The City Engineer can furnish particulars.——West Oakland, Cal.: The agitation for a better sewerage system continues at this place.——Rockaway, N. Y.: The Board of Sewer Commissioners has determined upon gravitation as a system of sewerage for this village. The work will be pushed forward as speedily as possible during the winter.——Macon, Ga.: The bill providing for the sewerage of this city was presented to the City Council November 25, and referred to the Legislative Committee for action and report. Representative Boifeuillet can furnish particulars.

WATER-WORKS NOTES.

Lincoln, Neb.: $25,000 have been appropriated for water-works improvements.——Franklin, N. H.: $80,000 have been voted for a system of water-works.——Crisfield, Md.: A company with a capital of $10,000 has been formed. Address G. T. Atkinson for particulars.——Madison, Ind.: The council has directed the purchase of 1,500 feet of hose.——Seattle, Wash.: The Trustees have purchased the Springhill water-works plant and will make extensive improvements at once.——Wheatland, Iowa: The project to improve the water supply is now a certainty.——Kettle Falls, Wash.: $15,000 will be spent at once for water-works, water-mains, etc. Address A. D. Burns.——Halifax, N. S.: The city council has decided to engage an hydraulic engineer to make an examination of the water-works system, with a view of making such improvements as may be necessary. Address Alderman Lyons for particulars.——Madrid, Neb.: The Madrid Water and Improvement Company has been incorporated for the sinking of artesian wells and making such other internal improvements as may be desired, The capital stock is $5,000, and the incorporators are D. D. Dayton, N. T. Potter and others.——Milledgeville, Ga.: The question of increase of taxation for water-works will be submitted to the voters of our city on December 9. Address the City Clerk.——Whitestone, L. I., N. Y.: A special election has resulted in a vote of 98 to 39 in favor of water-works. The Board of Water Commissioners estimate the cost at $35,000.——Perth Amboy, N, J.: With the purchase price of the company's plant and the cost of a six-mile supply-main from Mill brook to the city and other improvements, $200,000 will be spent by the city for water-works.——Veru, Kan.: The Arkansas Land and Irrigating Company has been incorporated. Authorized capital stock, $1,000,000.——Aberdeen, S. Dak.: The New York Land and Irrigation Co. proposes to buy lands in the James River Valley, mostly in Spink and Beadle counties, sink artesian wells on the same to secure water for irrigation, and to sell the land in small tracts to farmers. The company has an authorized capital stock of $1,000,000, of which $200,000 has been paid. S. D. Thomas, an ink manufacturer, is president, and C. W. Barringer, Huron, S. Dak., is vice-president.——Franklin, Ind.: The Boughen Engineering Co., of Cincinnati, O., is preparing plans and specifications for a system of water-works.——Bay City, Mich.: The water company is considering the project of removing its pumping machinery to the recently purchased Moore property, and putting in a filtering plant to purify the bay water.——Jersey City, N. J.: The Board of Trade has been devoting considerable attention again to the question of obtaining a new water supply. A scheme has been prepared for taking a supply from the Ramapo Valley. Companies known as the Ramapa Water Companies have been formed in both New York and New Jersey to secure the supplies.——Lowell, Mass.: The city will shortly advertise for bids on a new pumping engine for the water department. These bids will call for an engine having a pumping capacity of 10,000,000 gallons in twenty-four hours, and the bidders will have to figure on making an engine so that it can be in running order in nine months.——Kittanning, Pa.: The Water Company contemplates putting in 2,000,000-gallon pumping engines in the spring, to take the place of those of 700,000 gallons now used.——Boise, Idaho: The Artesian Water Company will construct a large reservoir immediately, to afford sufficient storage of water to give the city complete fire protection.——Sherman, Tex: The Board of Trade is working for a water-supply, sewerage and street improvements.——Muskegon, Mich.: The city council has authorized the purchase of 2,000 feet of hose for the fire department.——San Francisco, Cal.: The su-

pervisors have been requested to purchase a second water-tower. ——Plaquemine, La.: An election will be held January 5th upon the question of taxing the town for water-works and electric lighting.——Ridley Park, Pa.: The Ridley Township Water Company has been incorporated.——Sacramento, Cal.: G. A. Stoddard and E. M. Lockett have reported that the present pumping engines of the water-works have become inadequate, and have advised in favor of putting in an additional pump of 5,000,000 to 10,000,000 gallons capacity.——Columbus, Mo.: Bonds have been voted for the purpose of introducing a system of water-works. Address the Town Clerk for particulars.——Orange City, Iowa: The people have voted in favor of water-works.——Pine Grove, Pa.: The Pine Grove Water Company has been organized to establish a plant; capital stock, $40,000. Address Jacob Ulmer for details. ——Burlington, Wis.: This village decided, November 25, in favor of bonding itself for $8,000 to put in 2½ miles more of water-mains and build an additional reservoir at the pumping-station. The work will be let during the winter, and commenced as soon as the weather permits in the spring.——Canton, S. D.: At a special election, held November 25, it was decided to bond the place for water-works.——Hoquiam, Wash.: A system of water-works costing $100,000 is now being considered by the Eastern capitalists, and will be constructed immediately, provided the city will grant the necessary franchise.——Omaha, Neb.: The Board of Health ordered an open well filled up, against the wishes of the owner, upon the ground that the water was polluted. The owner appealed to the city council, and, according to the local press, analysis of the well-water and of water taken from a near-by city hydrant showed the former to be the purer. ——Winnipeg, Man.: The promoters of the water-power-works scheme have modified their original proposition to the city, and its acceptance has been recommended by the Finance Committee.—— Fargo, N. D.: The Committee on Fire and Water has been authorized to contract with any citizen who may wish to lay mains at his own expense, and receive credit on water accounts for the amount expended in laying such mains.——Butte, Mon.: Arrangements for a new water supply are almost completed. The deal involves an expenditure of a million dollars. The water of the Nez Perce creek in Elk Park, amounting to 150 inches at its lowest stage, and owned by E. M. Trask, who has been using it to flume wood, has been purchased, it is said, by the Anaconda Company for a handsome figure. To convey this water to Butte, several tunnels will be cut and a large number of men will be employed.——Salt Lake City, U.: The council, at a meeting last week, adopted an order requesting the city engineer to furnish plans, etc., for increasing the water supply of the city.——Pueblo, Colo.: The Pueblo Water Company, which succeeds the South Pueblo Water Company, is officered by E. M. Steck, president; C. J. Dunbaugh, vice-president and manager, and J. A. Joy, secretary and treasurer. The present capacity of the works is four million gallons every twenty-four hours. In the next six months this capacity will be doubled.

BIDS AND CONTRACTS.

Potwin, Kan.: Bids are invited for the construction of the Auburndale sewer district.——Victoria, B. C.: Tenders will be received up to 4 o'clock on the 17th of December, at the office of the undersigned, for the construction of sewers for the corporation of the city of Victoria, B. C. For particulars of plans and specifications apply at the City Hall, Victoria, after the 15th day of November. Estimated cost of sewer, $300,000. Wellington J., Dowler, C. M. C.——Toronto, Can.: Tenders will be received by registered post, addressed to the City Engineer, Toronto, up till noon on Tuesday, December 23d, for supply of pipe for year ending December 31, 1891. Approximate quantity of pipe required: Six-inch pipe, 35,000 feet; 6-inch bends, 200; 9-inch pipe, 5,000 feet; 9-inch bends, 100; 12-inch pipe, 12,000 feet; 12x6-inch junctions, 800; 12x9-inch junctions, 200; 15-inch pipe, 3,000 feet; 15x6-inch junctions, 200; 15x9-inch junctions, 100; 18-inch pipe, 500 feet; 18x6-inch junctions, 20; 18x9-inch junctions, 40; 1 foot 2 inches x 1 foot 9 inches tile invert, 2,000 feet; 2x3-foot tile invert, 3,000 feet; 6-inch stoppers, 800; 9-inch stoppers, 200. John Shaw, Chairman Committee on Works,——Cincinnati, O.: Sealed proposals will be received at the office of the Board of City Affairs, Cincinnati, O., until 12 o'clock noon of December 26, A. D. 1890, for four vertical pumps of 5,000,000 capacity each in 24 hours. These pumps to take the place of similar size Wetherill pumps now in position, and to operate by the steam ends now in use. Each bidder is requested to examine and measure the well, and so design his work as to properly connect with the parts to be retained. Each bidder will be allowed to furnish his own plan, drawings and specifications, with guarantee as to date of completion, and forfeiture for failure in time; also will be required to give proposition on plans and specifications furnished by the Board of City Affairs. For particulars apply to Willis P. Tharp, Superintendent and Engineer of Cincinnati Water-Works. Thomas G. Smith, President.——St. John's, N. F.: Applications for the position of Town Engineer will be received by the undersigned up to the 18th day of December. Applicants are required to state the salary they expect, and give a concise epitome of their professional experience and municipal works on which they have been engaged. Not more than five testimonials to accompany each application. Traveling and personal expenses to St. John's will be paid by the Municipal Council. Salary will commence from date of arrival in St. John's. P. W. Kelly, Secretary Municipal Council.——Americus, Ga.: Proposals are invited for sinking an artesian well at Americus, Ga. Two flowing wells in city at same level. For particulars address J. B. Felder, Mayor.——Lowell, Mass: Sealed proposals, indorsed "Proposals for Pumping Engine," will be received at the office of the Lowell water-works, City Hall, Lowell, Mass., until 2 P. M. on Friday, Jan. 16, 1891, for the construction, delivery and erection of a 10,000,000-gallon steam pumping engine for the city of Lowell, Mass., and at that time will be publicly opened and read. Specifications will be mailed upon application to water-works office, City Hall, Lowell, Mass. Address George M. Barrus, M. E., 95 Milk street, Boston, Mass.——Frankfort, Ind.: Proposals are wanted until December 19 for lighting, by electricity and gas, the public streets, etc., of Frankfort, Ind., for a period of five years. Address S. A. Cook, City Clerk.——Mt. Vernon, O.: Proposals are wanted until Dec. 11 for the construction of certain sewers. Address P. B. Chase, City Clerk.——Brooklyn, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P.M. on the 18th day of December, 1890, for all the labor and material required for the approaches to the U. S. post-office, etc., building at Brooklyn, N. Y., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Brooklyn, N. Y. Jas. H. Windrim, Supervising Architect.——Detroit, Mich.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 17th day of December, 1890, for the iron beams, etc., for the first floor, basement, columns, etc., for the U. S. court-house, post-office, etc., building at Detroit, Mich., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Detroit, Mich. Jas. H. Windrim, Supervising Architect.——Chicago, Ill.: Sealed proposals, in triplicate, for rebuilding superstructure over 5,243 feet, more or less, of breakwaters in Chicago Harbor, Ill., will be received at room 90, No. 134 Van Buren street, until 12 o'clock noon, Saturday, Dec. 13, 1890, and opened immediately thereafter in the presence of bidders. W. L. Marshall, Corps of Engineers, U. S. Army.——Washington, D. C.: Sealed proposals, in duplicate, indorsed "Proposals for Officers' Quarters at League Island." will be received until 12 o'clock noon, on Tuesday, Dec. 16, 1890, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be forwarded upon application to the commandant of Navy Yard, League Island, Pa. N. H. Farquhar, Chief of Bureau.——Hot Springs, Ark.: Sealed proposals for furnishing the material and labor required in the construction, on the Hot Springs Reservation, at Hot Springs, Ark., of a brick building, to be used as an office by the superintendent, will be received at the Department of the Interior until 1 o'clock P. M., Tuesday, Dec. 16, 1890, when they will be opened. Blank forms of proposal, embracing specifications, may be obtained upon application to the department, or the superintendent of the reservation at Hot Springs, where drawings showing details may also be inspected. John W. Noble, Secretary.——Pittsburg, Pa.: Sealed proposals will he received at the office of the Supervising Architect of the Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 17th day of December, 1890, for all the labor and materials required for concreting the floor of basement, etc., of U. S. court-house and post-office at Pittsburg, Pa., in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the superintendent at Pittsburg, Pa. Jas. H. Windrim, Supervising Architect.——Ballinger, Tex.: Bids for water-works are open until January 1st. Address B. S. Taylor, Mayor.——New York City: Bids for an electric light plant for the New York Navy Yard are open until December 16. N. H. Farquhar, Chief of Bureau of Yards and Docks, Washington, D. C. ——Belvidere, Ill.: Sealed proposals will be received by the City Council of the city of Belvidere, Ill., until 7 o'clock P. M. of Tuesday, December 16, 1890, for the construction of a system of water-works, according to plans and specifications of the same, which may be seen at the office of George H. Hurlbut, chairman of the

Water-Works Committee. All proposals must be sealed and marked "Proposals for Water-Works," and must be in the hands of said Geo. H. Hurlbut on or before the time stated above. The works to be constructed are, in general terms, as follows: Pump-house, with boiler and pumps; storage reservoir, stand tower, six miles of pipe line, and seventy-two fire hydrants. Proposals will be received for the entire system complete, and also for labor and material separately. A. E. Jenner, City Clerk.

A GIRL WORTH HAVING.

A few weeks ago I read in your paper Mr. Morehead's experience in the plating business, in which he cleared $167,85 in a month; but I beat that if I am a girl. I sent as he directed and got a plater, and cleared $208.17 in one month. Can any of your readers beat this? You can get spoons, forks or jewelry to plate at every house. Send $3 to W. H. Griffith & Co., Zanesville, O., and they will send you a plater, and you can make money enough in three hours to pay for it, or address them for circulars. There is plenty of work to do in both city and country; then why should any person be poor or out of employment with such an opportunity at hand. I hope my experience will help others as much as Mr Morehead's did me. LAURA B——

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. MARTIN, General Passenger Agent, Cincinnati, Ohio.

NEW TORONTO SLEEPING CAR LINE.

The Wabash Railway, in conneetion with the Canadian Pacific Railway, has just put on a new line of through sleepers between Chicago and Toronto. They will leave Chicago daily at 9:05 P. M., via Wabash, and arrive at Toronto next evening. Returning, they will leave Toronto at 2:30 P. M., daily, via Canadian Pacific, and arrive at Chicago at 7:15 A. M.

The above is in addition to the through Montreal sleeper, via same lines, leaving Chicago daily at 3:00 P. M.

FOUR trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

BURLINGTON ROUTE—BUT ONE NIGHT TO DENVER.

"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

THE ONLY ONE.

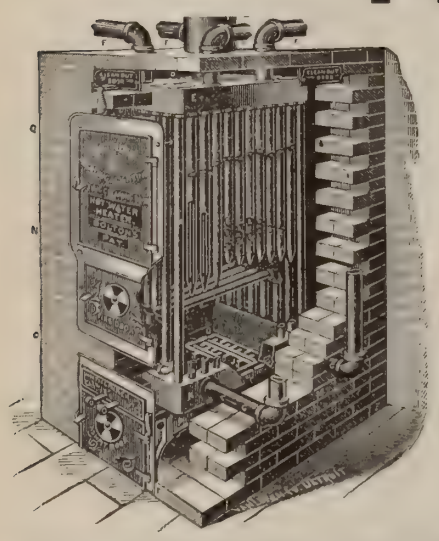
The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Milwaukee, St. Paul and Minneapolis.

The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Council Bluffs, and Omaha.

The berth reading lamp feature in the Pullman Sleeping Cars run on these lines is patented, and cannot be used by any other Railway Company. It is the great improvement of the age. Try it and be convinced.

For tickets, sleeping car reservations, and all information, apply at the Company's ticket office, 207-209 Clark street, or at its Passenger Station, Madison, Canal and Adams streets.

Bolton Hot Water HEATER



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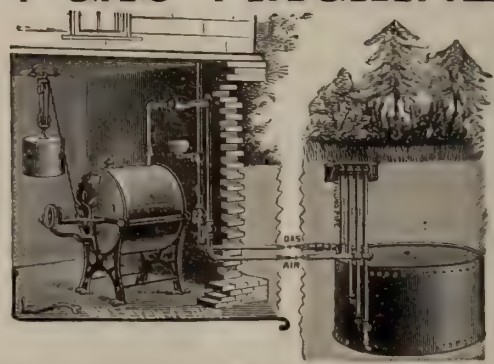

MOST ECONOMICAL, DURABLE AND EASILY MANAGED.

OMAHA, NEB., Jan. 17th, 1890.

Gentlemen: I have only good reports to make of the heater under great trials. Burning wood in two of the smaller fire pots (against your printed rules) and coal in only one. We have passed through the worst test with the Bolton that we shall ever see, or as bad as any that can come. A sharp searching wind, with the mercury 15 degrees below zero, last Wednesday night, and the following Thursday, which was little better, found the big house comfortable in every part, without the help of any strain on a single fire pot in the grates. When I repeat that there are 22 large and small windows exposed to that terrible blast on the north side of the house, and that I used half green wood in two of the fire pots, as I am doing now when the weather is still severely wintry, there is nothing to say but what I do say to you and to everybody, that the heating of my big house from top to bottom, without any door between any of the great rooms below, big hall, dining room and two immense parlors and stair case open to the top, is something about which I am both pleased and surprised. Yours respectfully, GEO. L. MILLER.

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INFERIOR material and cheap workmanship may cost less money at the start, but they will be the most expensive in the end. It is economy to procure the best class of plumbing work, to say nothing of its security in the consideration of health.

THE Executive Committee of the National Association of Master Plumbers will hold a meeting some time in January next—notice of time and place to be given hereafter. All matters of importance which the trade desires to have brought before the meeting should be sent to headquarters, 427 North Clark street, Chicago, as soon as possible.

THE New York *Tribune*, in a few issues since, contained the following in its editorial columns:

"Piracy and highway robbery have been so often condemned by both press and pulpit that were we to speak disparagingly of either, no doubt an apology would be in order for the triteness of the observation. So, too, perhaps, before saying anything of plumbers and their ways, the indulgence of the reader may very properly be asked. The plumber, like the pirate and the brigand is invariably looked upon with suspicion by people in good society the world over. Much of this suspicion in regard to all three, but more especially in the case of the plumber, we believe to be undeserved. Of course, the plumbers are always preposterous, and the time he will consume on a small piece of work is simply outrageous; but otherwise he may be a very worthy member of society, and no worse, perhaps, than the iceman. It is at this season of the year that the plumber is particularly active, doing more robbing—that is to say, plumbing—doing more plumbing than at any other time in the twelve months. It is for this reason that we desire to say a word on one peculiar point of the plumber's ways, namely, his trick of 'holding a job,' as he is pleased euphemistically to term it."

Here is another very strong evidence that editorial writers should be strictly temperance men. From the above it will be seen how easy and how fatal it is for a maudlin mind to rush into print when it has an opportunity. The above product of a fuddled mind is enough to make the departed shades of both Greeley and Murray groan in much suffering. The next spree this great editor gets on, he will write an article about the gas-man. He will then load up and fire away at that other new subject, the mother-in-law. Next spring he will have a slashing editorial on the spring bonnet. Everything he writes after that will be about snakes.

VENTILATION AND TYPHOID FEVER.

Naturally, the ventilation of buildings is poorer in the fall than at any other time of the year. It is the season that is neither hot nor cold—a season not cold enough for fires, and not warm enough for open doors and windows. Consequently, there is no ventilation by furnaces, or any indirect means of heating, and none by the open window or door. This means ventilation only through crevices or by percolation, which is always inadequate and the cause of much mischief. *Carpentry and Building*, in speaking of ventilation at this season of the year, says:

"More thought is given to the subject of ventilation during the fall and early winter than at any other time of year. We do not mean that professional sanitarians annually await this season to study the laws of ventilation, and give no attention to it during the remainder of the twelvemonth, but rather that the public at large are now forced, by considerations of health and bodily comfort, to thoroughly consider the best means of obtaining fresh air, In the summer-time windows and doors are wide open and the air circulates freely through stores, offices, street-cars, boats, and all other stationary and moving enclosures; but with the first coming of cold weather, down with a bang go the windows, and slam go the doors, and the poor imprisoned people immediately begin to suffer from drowsiness, nausea, headache, faintness, and all other ills that attend the breathing of foul air. This brief season between summer and winter is the most trying in the whole year, and is much worse than the corresponding period in spring; for by the latter time people have, in a measure, become accustomed to breathing obnoxious gases of all sorts, and, furthermore, artificial heat is continued till summer's warmth arrives, and so makes it possible to open windows in the intermediate time of cool weather, But in the fall all this is different; for heat from furnaces, stoves and boilers is economized till the last moment, and in the meantime every cool-air entrance is kept hermetically sealed, lest some one suffer from a chilly draft. When winter really arrives the conditions become more wholesome. The furnaces and indirect radiators deliver large volumes of fresh air into the rooms and apartments; and even where direct heating systems are employed. the plentiful supply of heat renders window and door ventilation possible without attendant discomfort."

The truth of the above is manifest to all who have observed the features of natural ventilation; and to those who have not, a little thought on the subject will convince them that it is true. The season for "putting up stoves" is delayed as long as possible; the furnaces and boilers are left cold as long as possible, in order to save coal. In the meantime the rooms are shut tight, the days are shorter, the gas is burned longer, and every condition for the very worst ventilation is present during the fall, just before the colder weather sets in and fires become a necessity.

It is also observed that during the fall typhoid fever is the most prevalent and fatal. On this subject the *British Medical Journal* says:

"It must be admitted that, next to tuberculosis and the professional politician, typhoid fever is the most terrible scourge of civilized mankind. In spite of all that is written, and in spite of all that has been done, this huge specter of disease stalks through the land every autumn, and picks out its victims of every age and every rank; the same daily paper brings in news from Scotland of the death of the wife of a prominent politician, and a member of the richest family in the world; of a well-known comedian in London, and of poor Tommy Atkins in an out-of-the-way barrack in Ireland. Why typhoid fever is most prevalent and most fatal in the autumn no man knows; there are, indeed, few things in biological science more mysterious than thls preference of infectious diseases for certain seasons of the year. Dr. Bryden, the great Indian sanitarian, compared it to the succession of plants in the different months of the year, and the analogy is, probably, in its basis, sound. Our forefathers gave more attention to this question of seasonal prevalence of disease than we do, but they regarded it from a fatalistic point of view, which would find few sympathizers in the present day. Sanitary science has taught us that, theoretieally at least, there is a way of preventing typhoid fever and its cogeners, and sanitary legislation has taught us that where there is a will there is a practical way also. But the increased liability to certain infectious diseases at certain periods is a point worth bearing in mind; for instance, the typhoid fever which is now producing irremediable gaps in the families of high and low was probably contracted during the brief summer which came to this country with the last days of August. The moral is almost too trite to enforce: A chain is no stronger than its weakest link. Until every man sets his own house in order, and insists that all hotel-keepers, lodging-house owners and restaurateurs take the pains to make the sanitary arrangements of their houses conform to rules of construction, so well understood and so often repeated that it would seem that everybody ought to know them by heart, so long shall we hear from time to time, and especially at this season of the year, of fatalities such as that which recently cast an added gloom on one of the darkest and gloomiest weeks of a gloomy month."

Here we have a coincidence with no special reason given for it. The reason why ventilation is poorest this time of year is plain enough, but why typhoid fever is the most prevalent and fatal during the same season, no reason has been ventured or cause given. There is, perhaps, no one reason. There are, probably, several reasons, and the poor ventilation always present during the fall may be one, and a very prominent one. It is well known that the typhoid bacillus may be taken into the system of individuals without producing any ill effects; that a healthy person—one strong and vigorous—is much less vulnerable to the attacks of disease than one who is less fortunate in regard to health. Poor ventilation produces a low state of health, and makes of the unfortunate victim an easy prey to disease. It is more than probable that the germ of typhoid finds a suitable lodgment in those debilitated by poor ventilation, and that the poor ventilation that prevails during autumn is in part responsible for the increase of typhoid fever during this season.

NOTES AND NEWS.

The managers of the National Electric Light Association have decided to hold the next convention at Providence, R. I., Feb. 17th, 18th and 19th.

A dental scientist is quoted as authority for the statement that caries of the teeth is due to a contagious germ, and can be easily contracted by kissing.

The gum on Uncle Sam's postage stamps contains alcohol in the proportion of one to eight. No true prohibitionist will lick his stamps after learning this fact.—Indianapolis *Journal.*

The high rate of mortality among the shop girls in the monster shops of Paris, 6 per cent, is largely due to premature vital exhaustion from being unable to sit down throughout the day.

Seaweed is now made into a tough paper which takes the place of window glass. When colored the effect is similar to stained or painted glass.

A law is in force in England giving to the health authorities power to tear down any building which may be deemed injurious to public health, and also to regulate the number of inmates of any house.

Professor Orton, while urging the imperative necessity of taking action to restrict the wasteful use of natural gas, admits that even the strictest regulations can not prevent the exhaustion of the supply in a few years.

The Society of German Engineers, Europe, has arranged to offer two prizes of $720 eaeh for the best papers on smoke prevention, one for steam boilers, and one also for domestic furnaces, with additional prizes of $240 for drawings.

Dr. Richardson says: If by some magic spell, England could wake up to morrow clean, she would wake up pure also in spirit and godly in the recompensiveness of goodness. Cleanliness covers the whole field of sanitary labor. It is the beginning and the end; practiced in its entirety it would banish all disease from the world.

The corporation of Liverpool constructs its public streets in the best manner. The pavement is not allowed to be disturbed by private parties for any purpose whatever. When it is necessary to take up any portion, the work is done by the corporation, but at the expense of the interested parties.

In New York, directly in the midst of an immense baby population, a German and his wife recently started a bathing house for babies, and during the past summer have done a rushing business. The charge of the bath is ten cents, which includes the dressing and undressing of the child and a thorough wash.

In Birmingham, England, there is in operation a compressed air plant driven by engines of 3,000 h. p. and supplying small manufacturers over a territory four miles in extent. The pipes are laid through the streets like gas and water mains, and no difficulty has been experienced in keeping them perfectly tight.

Never put away food in tin plates. Fully one-half the cases of poison from the use of canned goods is because the article was left or put into the can after using. China, earthenware or glass is the only safe receptacle for food "left over."

For those who do not care for sweats a refreshing beverage may be prepared by using salt instead of sugar in the preparation of lemonade. The drink is suggestive of pickled limes, a delicacy dear to all school girls.

A lady in Americus, Ga., is using a lamp chimney she has had and used daily for the past eight years, and she expects to use it for many years yet. She says that she boiled it in salt water when it was bought in 1882, and no matter how large a flame runs through it, it won't break.

Closets should be aired the same as bedrooms, and the coming architect, if a woman, will see to it that closets in which clothes are hung are provided with a window, be it ever so small, going out to the yard. This window will be protected so that in nearly all weathers it may remain open and supply the closet with fresh air and light.

Medical students in London are compelled to go through a course of four years' study, hospital attendance and lectures, before being qualified to appear for the final examination. By an order of the General Medical Council of England the term of preparation has been extended to five years.

A good formula is: Venetian red, finely powdered, 3 troy ounces; oil of turpentine, 12 fluid ounces; oleic acid, 1 fluid ounce; ammonia water, ½ fluid ounce; alcohol, 1 fluid ounce: oil of sassafras, 10 minims. Mix; shake on using. To clean the brass apply with a rag, and clean off when dry with whiting or precipitated chalk.—*Invention*, London.

The island of Heligoland, whose name has lately figured so prominently, is another illustration of the microbe purity of ocean air. In 1888 only twenty persons died out of its population of 2,000. Of these twenty deaths, fourteen occurred in persons past seventy years of age, and none occurred among children. The average age of the twenty decendents was sixty-six and one-half years.

On the "Athletic craze" Dr. O. W. Holmes says: "Whether the excessive development of the muscular system is compatible

with the best condition of general health is, I think, more than doubtful. The muscles are great sponges that suck up and make use of large quantities of blood, and the other organs must be liable to suffer for want of their share."

A hoisting device has been patented by Mr. William P. Campbell, of Rome, Ala., in which a weighted sweep pole is used. In this machine the multiplying power of a rope and pulleys is employed to give the bucket a greatly multiplied motion. This improvement is designed for raising water from wells, hoisting brick and other materials for building purposes, and for analogous uses.

There could scarcely be a more striking object lesson, says the *British Medical Journal*, as to the value of vaccination if thoroughly carried out than is afforded by the example of Holland. Between 1870 and 1873 there were 20,575 deaths from small-pox in that country. A stringent law was then enacted making vaccination compulsory, with the result that the small-pox mortality has since steadily diminished from year to year. During 1890 only one death from small-pox has so far occurred in the whole of Holland.

It is asserted that by adding peroxide of hydrogen to water in the proportion of 1 to 1,000, not only will all the microbes usually present in the latter be destroyed within 24 hours, but also the germs of disease (cholera, typhus, etc.) This is recommended by Altehofer as a cheap and reliable method of disinfection in times of epidemics, not only from its efficiency and cheapness, but also because the potability of the water is not altered.

The State Board of Health of New York, after a careful investigation of the subject, recently came to the following conclusions as to the effects of impure ice in causing disease: "Ice formed in impure water has caused sickness; it may contain from 8 to 10 per cent of the organic matter dissolved in the water, and in addition a very large amount of organic matter that had been merely suspended or floating in it; it may contain living animals and plants ranging in size from visible worms down to the minutest spores, and the vitality of these organisms may be unaffected by freezing."

The New York Dairy Commissioner says that milk can be sent further and will be in a better state for use when aerated down to the temperature of the atmosphere than when chilled and sent on ice. The process is very simple, and consists in allowing the milk to run from one receptacle to another in fine streams, so as to come thoroughly in contact with pure air. It should not be done in the barn or stable, but out of doors where the air is purest. If nothing better is at hand, let it run through an old colander two or three times. A better arrangement is a set of perforated pans one above the other, through which the milk may run in fine streams.

Sir Erasmus Wilson, the celebrated authority on skin diseases, gives these directions for washing the face: Fill your basin about two-thirds full of fresh water, dip your face in the water, then your hands. Soap the hands well and pass them with gentle friction over the whole face. Then dip the face in the water a second time and rinse it thoroughly. A second basin ready with fresh water is a valuable addition. The wrong ways are using the towel, sponge or flannel as a means of conveying the soap to the face and omitting the rinsing at conclusion. Then as regards drying the face, a moderately thick and soft towel should be used. A very rough one is not desirable nor one of thick texture. Rain or distilled water, owing to their purity and softness, are best for washing the face.

MICROBES IN AIR, WATER, SOILS AND FOODS IN RELATION TO INFECTIVE DISEASES.*

At last year's meeting of this association in Inverness, I delivered a general address on the subject of contagia, and from the encouragement my effort met with then, I am induced to take up the subject again, but entering more into detail, with the object of putting before the general reader an epitome of the knowledge we possess of the life history of that low class of organisms which we now identify as closely allied to the idea of contagion.

A few years ago, one writing on the subject I have selected would, of necessity, have had to enter into the wide sea of controversy regarding the origin of these organisms in the various media they occur in, but at this time this subject can be avoided for various reasons, as we are now about to discuss some interesting features of the life history of these organisms, without entering into the history of their origin. The simple fact is they exist and their existence is associated with most important phenomena in the domains of chemistry, physiology and pathology, and these associations cannot be denied even by those who believe in the theory of spontaneous generation, or by those who believe in the *de novo* origin of infectious diseases.

I do not intend discussing the origin of germs, any more than I wish to discuss the descent of man, or the descent of any form of plant or animal life. If, however, proof of the potent agency of micro-organisms were needed in producing, for instance, putrefaction, one has at hand proof which should convert the greatest skeptic; for no more extensive experimental proof on a large practical scale was ever given to any scientific investigation than by the everyday experience of the use of preserved foods and vegetables. Millions of tins of fruits, vegetables and meats are annually consumed, after preservation for weeks, months or years, with perfect success, and this depending on, first, the recognition of the causes of putrefactions; and secondly, the adoption of scientific principles for destroying these causes.

You are aware of the processes carried out for securing the second condition, viz., boiling the fruits or meats, so as to insure destruction of any organisms they are affected by, and sealing the tins to prevent the ingress of fresh organisms. Here we have examples of disinfection or sterilization. I show you two tins of meats: One has been opened for a week, and you can see and smell the result, the other has only been opened to-day and you can detect nothing wrong, but in a week this one will be as bad as the other. Another proof, on a very large scale also, is the process of preserving all forms of animal or vegetable matter by refrigeration, that is to say, lowering the temperature sufficient to restrain at least the action of putrefactive organisms. In the laboratory it is not necessary to seal up hermetically the various animal or vegetable matters we wish to protect from the agency of these organisms; it is only necessary to boil the material, and then filter the air passing into the vessels in which the materials are preserved. In the tubes I show you, the material has been for years, the air passes freely in and out, with the varying pressure and temperature of the atmosphere, and no change in the substance has resulted, simply because the air has been filtered of its contained living particles.

It was a great day for hygiene, for preventive medicine, when Schwann clearly established the connection between putrefaction and something that could be seen under the microscope, a something that had shape, and form, and existence,—something *particulate*. No foe strikes greater terror than an unseen one, even if the darts he throws are feeble; but when the foe is both unseen, and the darts are deadly, the terror is redoubled, and the attacked have no defense. Such was the position of our "healing" art prior to Schwann, Cagnaird, Latour, Pasteur, Lister, Koch, and their distinguished followers, at least as far as those diseases which are amenable to the art of the sanitarian are concerned, for infective diseases were looked on with awe and superstitious dread, as mysterious influences unknowable as to their origin, and equally so as to the measures that were to be adopted for their prevention. Tyndall, writing on this subject, says, "Of that class of diseases now known to be caused by 'particles,' consider the woes which these wafted particles, during historic and prehistoric times, have inflicted on mankind; consider the loss of life in hospitals from putrefying wounds; consider the slaughter which has hitherto followed that of the battle-field, when those bacterial destroyers are let loose, often producing a mortality far greater than that of the battle itself." And further on he remarks regarding those unseen agencies, "We have been scourged by invisible throngs, attacked from impenetrable ambuscades, and it is only to-day that the light of science is being let in upon the murderous dominion of our foes."

The remarks that I have already made are only preliminary, but necessary to give a clear idea of the state of preventive medicine prior to the dawn of a new era, though the development

*Read at the Sixteenth Annual Meeting of the Sanitary Association of Scotland, held at Perth, July 24, 1890, by T. G. Nasmyth, M. D.

of the knowledge of living particles in relation to fermentations and putrefaction, and the application of this knowledge to medical and surgical science. Before entering into the subject proper of this paper, it must be noted that those living particles, about which we have been incidentally speaking, are known by various designations, but meaning the same. Thus, we speak of microbes, micro-organisms, micro-parasites, micro-phytes, lower fungi, fission fungi, germs, bacteria, etc.; and again, biologists have different classifications, but this does not concern us here.

In this paper it is impossible even to glance at all the various relationships of microbes, however interesting the subject might be, and however necessary it is to understand fully the important role these organisms play in the economy of nature; but it will be necessary to give a brief synopsis of their general features, so that their action as disease producing agents (pathogenic) may be more readily understood.

ROLE OE MICRO-ORGANISMS.

We have spoken of the work of Schwann in reference to fermentation, and this subject is one so closely bound up with the whole theory and history of microbe action, that a brief reference to fermentation is necessary. From time beyond history, brewers have prepared from malted barley a substance called "wort," and by the addition of a little yeast, a substance is produced, dear to man at all times, called alcohol. Without entering upon the subject fully, for this would be tedious, it is sufficient to note that in this process of alcoholic fermentation we have the wort—containing, amongst other things, sugar—changed by the agency of yeast into alcohol; and this yeast is a living plant, the torulae cerevisiae. In one of the tubes I show you, you have an example of the torulae, in this case a pink one. Alcohol, if allowed to stand, is itself subject to a change. Another organism attacks it, and we have instead a substance, not so dear to man, called vinegar; the ferment in this case is the mycorderma aceti. These are two examples of fermentations; but there are others, in each case due to specific organized ferments; thus, in milk, we have the lactic acid fermentation, butyric, urea fermentation, and so on. Besides the specific substances produced, we have the evolution of gases.

PUTREFACTION.

It requires no strict chemical definition of this process to convey the meaning of the term, for the evidences of decay and putrefaction are everywhere, and are apparent to the senses of smell and sight. In a scientific sense we understand this process to mean the rapid and intense decomposition of nitrogenous, and chiefly albuminous, substances by nitro-organisms, with the evolution of foul-smelling gases. It would be beyond the scope of this paper even to enumerate the various products of putrefaction, but briefly to mention an important few will be useful. The first things that form iu albuminous substances are peptones, then leucine, tyrosine and a great many gases—carbonic acid, hydrogen, nitrogen, sulphuretted hydrogen, ammonia; and such substances as indol, skatol, phenol; and finally, what are called "ptomaines."

These products are specially selected from an extensive list, from their direct relationship to practical hygiene, being at all times present when we have decomposing animal or vegetable matters. Some of these products are deadly in their effects, and they all lead to what is called a "low state of vitality," about which there will be something said farther on. A fuller reference must be made to ptomaines, because modern research, by combined chemical and biological methods, points to the conclusion that the injurious effects of micro-organisms in tissues and fluids in the animal organisms are due to these, and that those injurious effects, from the ingestion of unsound foods, are due to these poisonous alkaloids called ptomaines. Amongst the poisonous—for some are non-posionous—may be mentioned pepto-toxine, neurin, muscarin. A ptomaine has been isolated from the bacilli of typhoid fever, which produced toxic effects on animals experimented on. Those substances called ptomaines produce the pernicious effects due to the entrance and growth of microbes into wounds, and the surgeon endeavors to combat this by preventing the organisms gaining entrance to wounds, as far as possible, and by the use of antiseptics to destroy those organisms which may have gained entrance. The next more advanced stage will be the use of agents which will neutralize the ptomaines which have been absorbed into the system.

Among other actions of microbes have simply to be mentioned the formation of pigments, the process of putrefaction, the breaking down of tissues and rendering them suitable for the food of higher plants containing chlorophyll. From what I have already stated, it will be seen that these lowly organisms are of widespread occurrence in nature. Wherever we have sufficient nutritive material, moisture and heat, they abound and develop. On the human body they are constantly present—in the mouth, nose, eyes, alimentary canal; and this time seems a favorable one for at once stating that it by no means follows that the presence of micro-organisms necessarily implies any evil consequences, or of even any importance at all. While it has been sufficiently proved that several diseases of a most important order are actually caused by micro-organisms, by far the greater number of these micro-organisms are not at all hurtful, while many are of direct benefit to the human race.

The mere finding of micro-organisms in tissues is not sufficient proof of their casual relationship to any disease present, and the observer must carefully keep in mind Koch's postulates, which are:

1. The micro-organisms must be found in the blood, lymph, or tissues of man or animal suffering from, or dead of the disease.

2. The micro-organisms must be isolated from the blood, lymph or tissue, and cultivated in suitable media, *i. e.*, outside the human body. These pure cultivations must be carried on through successive generations of the organism.

3. A pure cultivation thus obtained must, when introduced into the body of a healthy animal, produce the disease in question.

4. Lastly, in the inoculated animal the same micro-organism must again be found.

By careful attention to every point in these rules alone can erroneous ideas be prevented as to the causal relationship of microbes to diseases. At this time I do not intend dealing with the direct relationship of micro-organisms to disease, but to enter into some features of great sanitary importance, connected with the distribution of microbic life in air, water, food, soils, and in clothing, and to finish this paper by pointing out how immunity is secured to mankind against the ravages of disease-producing microbes by their own self-destructive actions and by the resistance, natural and artificial, of their hosts.

[Continued.]

TECHNICAL EDUCATION OF ARCHITECTS.*

Technical and practical education, though now to some extent separated, could till lately hardly be thought of as two separate things—at any rate in our own case, or indeed in the case of several other professions. The apprentice learned practice as he still learns it, by shining in it, and if he gained theoretical knowledge, he obtained it at the same time, and as he best could—partly, I may say, since this class was instituted, in this classroom. Now in all professions an effort is being made to impart technical training of some sort by a machinery created for the purpose. Perhaps it will clear the way for the topics which I chiefly desire to dwell on if the two other observations that ought to be made about practical professional education are made at this first stage, before rather than after we reach the technical.

For no profession is a theoretical or collegiate education, however complete by itself, an adequate preparation. Probably at the present day no system of professional education is so complete as the medical, and apprenticeship is there done away with. But the reason is, that the hospitals, and outside them, a vast field of practical experience under the most eminent examples and teachers is open to the student, and he, for much of his long and arduous period of studentship, is laboring night and day in the wards of the hospitals where he is studying, or among the poor in their own houses in the province which the hospital serves or at the out-patient's department. Meantime every sort of disease, and every sort of surgical case, is being so treated by the first men of the day under his notice, that the student not only knows and sees all that is done, but learns the reason why, and, as a dresser or a clinical clerk, and later in higher appointments, takes as active a part in the work as the progress he has made renders possible. For few professions, again, has a scheme

*From Professor T. Roger Smith's opening lecture at University College, delivered October 2, 1890.—*Architecture and Building*.

of thorough instruction been so completely elaborated as for mechanical engineers in this college, lately under Professor Kennedy, and now Professor Beare. Yet let a student go through this whole scientific course, take his A. B. C. degree, and master all that can be taught in this or any college, and the first thing his friends find is that he must now be articled to an engineer for about two years to work in the pattern-shops, the fitting-shops, the forge, and so forth, wearing the dress and doing the work of a mechanic. The same thing is true of any practical profession. The practice can only be learnt by practice.

As a result, I think it is not likely that the practice of apprenticeship, or, to give a more dignified name, pupilage, will cease in our profession. This was hardly my belief years ago, but the more I have seen and experienced of what can and what can not be learnt under class instruction and under pupilage respectively (and I have had more opportunity than most of comparing the two), the more I am convinced that neither can dispense with the other. A radical change did take place when for the old apprenticeship for seven years was substituted the now customary short term of three years, and this alteration, made as it was without the necessary and corresponding provision of means to supplement this brief period by some course of preliminary or concurrent systematic study, has flooded the profession with young practitioners, not a few of whom are, to put it bluntly, lamentably ignorant.

What ought now to become customary, and I hope will, would be for any young man who is to be an architect, to take a well-arranged course of preliminary technical instruction extending over one year at least, and when practicable, over two, and then to begin his three years as a pupil, continuing part of his theoretical studies in his evenings, and doing the practical work in the day. And I propose, in considering the technical education of an architect, to try to point out what kind of course such a student should take up, and incidentally to show what facilities this college presents for such a course.

Coming now to a closer examination of the technical education of architects, some of us may feel that the phrase "technical education" has been used again and again without any attempt to define, or even to comprehend what is meant. Of this phrase, now on everyone's lips, I have never seen a definition attempted, and I confess to feeling not a little difficulty in suggesting one. It might at first sight be thought that "teaching an art" corresponded very closely to the sense of the words, but this is not quite what is meant at the present day, and probably "training for an art" more nearly expresses what is done in those noble institutions where those who are to pursue useful arts are receiving instruction, directed partly to teaching them to understand what they will have to do, and partly to develop such skill, manual or mental, and imparting such knowledge as shall help in the acquisition of practical power. What goes beyond this—like the medical curriculum to which I have alluded—is called, and properly called, practical, professional education. As the popular technical educational movement for artisans is understood and carried out, it is not to be supposed that the institution will educate pupils into skilled artisans ready to work, but that it will supply them with such theoretical knowledge, and possibly develop in them manual skill in such work, for example, as mechanical drawing, as will enable them to become better artisans than they otherwise could be.

So with architects. The technical education of architects has special reference to their instruction in this science and in the theory of this profession and their training in the skilled arts, such as draughtsmanship, which it is requisite for them to possess.

A statement of what this technical education for members of our profession must consist of, looked for, if anywhere, in the programme of the intermediate and the first examinations established for the Institute of Architects.

The candidate in the intermediate examination is required to do as preliminary work a considerable amount of drawing, and this will of course be looked upon by the examiners, first, from the point of view of draughtsmanship, and then, if sufficiently well drawn, scrutinized to see what evidence it gives of familiarity with the general forms, the details and the ornaments of the orders and of English Gothic architecture, and to some extent with what is known about the buildings from which the examples are taken; and, further, in respect of construction, to see whether it gives evidence of some acquaintance with carpentry and joinery. The written and oral examination on art subjects is to take the same range as the drawings cover. That on construction includes the nature and employment of all the ordinary building materials, the calculations usually made in connection with the stability of buildings and the principles of construction, and a moderate amount of applied mathematics and physics. This examination it is expected that a student can pass in the course of his pupilage. When his studies have been carried so far with the addition of practical work that he is presumed to be fit for admission to the Institute as an Associate, the programme of the final examination requires evidence of a good general knowledge of architectural history and an acquaintance with the moldings and features of the various styles, and of a thorough acquaintance with these in the use of some one style; and it also requires the candidate satisfactorily to prepare a design for a building. The scientific subjects may be summarized as nearly the same as in the intermediate, with some omissions and some additions, that is to say, materials, construction and the calculations necessary for ascertaining the strength of materials and structures, but with the addition of sanitary science, and the omission of applied physics and mathematics. Of course, however, the student would be expected to know more about the subjects which appear twice in the final examination than in the second, subjects that may be considered as belonging especially to practice, include specifications, estimating, and, to some extent, professional practice, and dealing with unsafe buildings, though, of course, on the one hand, much of the construction—and of the preparation of a design—require practical skill as well as theoretical knowledge, and, on the other, professional practice itself is a very suitable subject for class instruction.

This statement is necessarily made in very general terms, and, in some cases, a single word in it, as, for example, construction or drawing, covers a very large and varied range of subjects, though all closely connected together. Still, we are now in a position—putting the three programmes together—to say that the education of the architect ought, in order to conform to the Institute minimum, to include, at least, drawing, elementary mathematics and physics, and their application to construction. The history and the actual forms, features and details of architecture, materials and construction, and sanitation, together with reasonable skill in designing and in preparing working drawings and specifications, and in estimates. Professional practice and dealing with dangerous structures are also required.

It is difficult to separate the whole course of the architectural development of the young practitioners into two halves and say this portion is practical and that is technical. What is learned in the class-room must be corrected on the scaffold, and, on the other hand, what is learned in the office must be elucidated in the class-room. But it is at least possible to point out what parts of this complex whole a college may with advantage propose to supply, and if we do as much as this we shall have carried the subject as far as in a single lecture it can be possible to advance it.

The committee of the Architectural Association, taking these very examination-schedules as the acknowledged guides, have prepared a suggested programme of technical education for architects, to be carried out entirely by means of evening work and entirely by classes and lectures to be established by the association, and this, which must be familiar to you, now claims our attention.

It appears to me very doubtful whether the technical part of this programme can be thoroughly and efficiently carried out by evening work alone; and though, of course, the conditions under which the Association works entirely preclude their committee's shaping its programme, otherwise there can be little doubt that this is a weak point in the proposals contained in the report.

Again, there can be very little doubt that an institution like the association, if it is to become the Architectural College for the metropolis, must ultimately be prepared to give instruction in all the subjects of study in this programme. But at the outset it appears to be an arduous task for it to collect competent in-

structors and to start classes in all the branches which are enumerated. There is not the smallest doubt that arrangements could be made to utilize existing institutions, as, for example, the college for the Association students, so that they might take up some of these subjects under existing teachers, while others might be from the first taken at Conduit street.

It happens to be the intention to go over all the subjects of the Institute's intermediate examination in the first two years of attendance, and those of the final one in the second two years. Students of the first two years' standing are to attend classes or studio three evenings a week for three hours each evening, and those of third and fourth years' standing are to attend three evenings one week and four the other. All students would on one evening have two consecutive lectures or classes of one-and-a-half-hours each, which seems to put a strain upon them, and once a fortnight the third years' students are to have two such evenings. This, if the scheme is carried out, may, I hope, be considered open to revision; an hour and a half is too long period for a lecture, though it may not be for a class, and the advantage of two such attendances immediately succeeding each other appears to be very doubtful.

Rightly, perhaps, the report lays stress upon the fact that the Institute programme does not comprise all that a student of architecture ought to study, but it may be open to doubt whether the subjects outside that programme do not serve to overweight the course, already very arduous, set before the students in the curriculum.

And it seems open to question whether all these should not be more distinctly set aside as *extra subjects*, both as to position in the programme of education and as to their place in the distribution of time. If, for example, the alternate Fridays on which the association does not hold its ordinary meeting were, throughout the four years for which the course lasts, devoted to lectures and meetings of classes on the extra subjects, there would be as many evenings given to them as are now proposed (studio work excepted) and they would be more distinctly set apart than they are. I am quite aware that considerations can be urged against this proposal, but being thoroughly convinced that the programme is too full, I throw this out as a suggestion, for what it may be worth, as a way to lighten it without entirely removing any subject from the list.

ESTIMATION OF NITRITES IN POTABLE WATERS.*

At first sight, the subject of my paper may seem somewhat out of place at a meeting specially intended for the advancement of pharmacy, but so many of our advanced pharmacists are interested in water analysis, and on previous occasions when kindred subjects have been brought before you they have been discussed with so much ability, that I feel no further apology needed as an introduction to my paper.

Probably no analyst feels that he has made a complete examination of a water unless he has at least made a qualitative test for nitrites, and if he finds indications of their presence he justly regards the water with suspicion; but, uncertain what further inference to draw, a quantitative examination is rarely made. Though this quantitative analysis, therefore, does not seem to be a matter of much importance in the present state of our knowledge, a series of experiments I am now making on the changes in composition of certain waters, by keeping under varied conditions, lead me to believe that ere long the study of these changes will be of great aid in enabling us to judge of the quality of a water, and especially of those waters which at the present time the chemist or medical officer can only state to be suspicious. One of these changes, and one of the most easily followed, is the variation in amount of nitrous nitrogen. As an example, I will quote that of the most extreme case I have yet met with. A water which from a mere chemical analysis would have been passed as "usable," when examined soon after drawing from the pump, showed no trace of nitrites. Three days after, it contained no less than 3.5 parts of nitrous nitrogen per liter, and on the sixth day after, it was again free from nitrites. Other changes proceeded pari passu, and these, together with a bacteriological examination, proved the water to be seriously contaminated.

It was when commencing this investigation that the want of a simple and reliable quantitative test for nitrites made itself felt. The metaphenylene-diamine and the naphthylamine tests were fairly tried, but did not answer my purpose; neither did titration with potassium permanganate. In working out the process for determining the amount of dissolved oxygen in water, which I described early this year in a paper read before the Chemical Society, the action of nitrous acid on potassium iodide, in the presence of a varying proportion of free oxygen, was determined, and the results led me to believe that after all the old potassium iodide aad starch test for nitrites could be made a reliable colorimetric quantitative one for water analysis. The results of my experiments having this for their object may be summarized as follows:

1. With the same proportions of acid, starch and potassium iodide, the rapidity with which the blue tint is developed, and the depth of tint, varied with the degree of oxygenation of the water.

2. The depth of tint increases with the time which elapses between the addition of the reagents and the observation. This is due to the fact that the NO liberated is acting continuously as a carrying agent between the oxygen dissolved in the water and of the air in contact with the surface of the fluid and the hydric iodide, liberating an equivalent of iodine corresponding to the oxygen carried.

3. The effect of temperature is such that comparisons cannot be made unless the fluids are within two or three degrees of the same temperature. Thus, e. g., at 63 deg. F., in very weak solutions, the color is not developed so rapidly as at 60 deg. F., cæteris paribus.

4. With the same proportioes of starch and iodide and in samples fully oxygenated, etc., the coloration varies with the amount and nature of the acid used.

5. The amount of potassium iodide added affects the result considerably. The larger the proportion of iodide, within certain limits, the greater the rapidity of the reaction.

6. The quantity and nature of the starch solution are also factors requiring recognition. If too large a proportion of starch be added, a marked reddish tint is first developed instead of the blue tint, and this reaction is still more marked if the starch solution has begun to change by keeping.

7. When all the above factors are constant, then the rapidity with which the blue tint is developed and the depth of tint varies directly with the amount of nitrite present in the water.

I need not trouble you with the account of the numerous experiments upon which these conclusions are based, nor of the further investigation conducted to ascertain how the information so obtained could be made available for rendering the iodine and starch reaction reliable as a quantitative test. I will merely give you now an account of the reagents required and mode of conducting the analysis which I have found to give the most satisfactory results.

REAGENTS.

1. Solution of starch and potassium iodide.

Starch in powder	0.2 gram.
Caustic potash	1.0 gram.
Potassium iodide	2.0 grams.
Water	200 c. c.

Add to starch 10 c. c. of water, and when uniformly diffused add the caustic potash. Dissolve without the aid of heat, and add the remainder of the water and the potassium iodide. Strain or filter. This solution keeps for months without appreciable change. Proportion of acid is needed to effect precipitation on boiling, but beyond that proper amount coagulation is again prevented by formation of syntonin.

From the coagulated jelly of a boiled egg, the soluble part of albumen which is imbedded in the coagulum cannot be readily removed by washing, owing to its collodial nature, even if the mass be finely divided. It will continue to yield soluble matter to a suitable menstruum on digestion.

But if the floccula coagulum, obtained from a strained solution of albumen by heat, under addition of the proper amount of acid, be thoroughly washed and then digested in two-one-thousandth di-

*Read at the Leeds meeting of the British Pharmaceutical Conference, by John C. Thresh, M. D., D. S.C.

luted HCl at incubation temperature, it will be found that not enough can be dissolved after twelve hours to yield a reaction with iodo-hydrargrate of potassium, capable of indicating albumen in 100,000 parts of solution.

The whole train of arguments that swing around this common pivot must fall when this falls, and the remark gains some significance that "not to know this is to be constantly liable to give unfair and false results."

If the blue color appears instantly, the water must be diluted with known proportions of nitrite-free water (saturated with air) until it is found by experiment that the color takes a few seconds to develop.

With a very little experience the approximate amount of nitrite present can be ascertained with considerable precision by these simple preliminary experiments. Now prepare a standard solution of sodium nitrite by diluting 1 c. c. of the strong nitrite solution with 200 c. c. of water. One cubic centimeter of this weaker solution diluted to 50 c. c. corresponds to 0.01 mgr. of nitrous nitrogen per liter.

Measure into the nessler glasses varying quantities of this dilute nitrite solution and fill up with water. Now take 50 c. c. of the water to be examined, or of the diluted water if dilution were found necessary, and to each add successively 1 c. c. of the starch and iodide solution and dilute acid and note how the blue tint develops. If none of the solutions correspond with the water a fresh series must be prepared. In this way, in a very few minutes, the amount of nitrite in any sample of potable water can be easily obtained with a very considerable approach to accuracy.

Since I commenced employing this test I have analyzed over 180 samples of water, 51 of which contained nitrite, varying from 0.005 to 3.4 parts of nitrogen per million, and I have no reason to suspect inaccuracy from the interference of other constituents in any single case.

To render the process more intelligible, I will give details of two determinations, and also, with the permission of your President, make an estimation in your presence. Two solutions were prepared for me by an assistant, and marked A and B respectively.

A. Fifty c. c. +- reagents gave a blue tint in about ten seconds. It was therefore about the proper strength for estimation.

Ten c. c. of the dilute nitrite solution was diluted to 50 c. c. and compared with the sample. The color seemed to develop a little more rapidly, but the difference was not very marked. Three solutions were prepared by diluting 5, 7 and 9 c. c. respectively of dilute nitrite solution to 50 c. c.

5 c. c. = 0.05 N per million, too weak.

7 c. c. = 0.07 N per million, too weak.

9 c. c. = 0.09 N per million, too strong.

Another solution, containing 0.08 N per million, was then made and compared with the sample; the blue tint developed a little more rapidly. The strength was certified to be 0.75 N per liter. The actual strength was 0.07 per liter.

B. Original water gave a dark-blue instantly.

Diluted to one-tenth, a pale-blue instantly.

Diluted to one-twenty-fifth, color developed in a few seconds.

Compared one-twenty-fifth with 0.5, too weak.

Compared with 0.10, a little too strong.

Now compared with—

0.08.....too weak.

0.09.....about right.

0.10.....too strong.

0.09 +- 25 = 2.25 N per liter. The actual strength was said to be 2.5 N per liter.

The following results may also be quoted as fair samples of the accuraey obtainable :

	Nitrous Nitrogen per liter. Present. Per million.	Found. Per million.
1	0.1	1.10
2	0.625	0.65
3	0.625	0.625
4	0.093	0.095
5	0.01	0.01
6	0.05	0.05
7	0.125	0.13

The time occupied by a determination is usually about five minutes; the reagents are easily made and preserved, and the necessary conditions easily observed. I can therefore recommend the process to such of you as may desire at any time to estimate the nitrites in potable waters.

AMONG THE PLUMBERS.

Fox & Co., of Las Vegas, New Mexico, inform us that they have recently sold their business to Hast & Connell, of that city.

The Detroit Sanitary Supply Company, under the wise management of Mr. C. H. Muckenhirn, is doing a very large business at present, and their patent "clean sweep, non-syphon sewer gas trap" is meeting with wonderful success wherever it is introduced. This firm will furnish 180 nickle plated half S traps and fifty-three bath tub traps for the new hotel Cadillac in Detroit, and the Hammond building will also contain 236 of the same traps. The firm will furnish the new hotel Chittenden, at Columbus, Ohio, with forty nickle plated traps and sixteen bath tub traps.

A. P. Mann has purchased the plumbing business of Kimball & Gresham, at Danville, Ill.

The commissioners who recently incorporated the Chicago Journeymen Plumbers' Protective and Benevolent Association are: Edwin S. Marsh, William J. McKenney and Frank K. Brock.

The official report of the Denver convention is being distributed as fast as possible at the national headquarters, 427 N. Clark street, Chicago. The SANITARY NEWS printed a full report in the issue of June 28th, which has been very highly complimented especially by Ex-President Hannan.

John D. Mouat, 47 Larned street, Detroit, Mich., is doing a large plumbing business in that city. His new hot water heater is winning success every day and will doubtless some day make its inventor famous.

The Detroit Lead Pipe & Sheet Lead Works will present to the trade, about Jan. 1st, an elaborate catalogue of their goods embracing everything in the line of plumbing, steam and gas fitting supplies and tools.

M. W. Cobb has purchased the business of Hayward & Greely, at Hannibal, Mo.

John Johnson, a gas fitter at Albany, N. Y., recently attempted to repair a leak in one of the chandeliers at the state capital. A lighted match was used to locate the defect and the usual explosion in such cases occurred, and severely injured the gasfitter.

G. M. Focht has started a plumbing shop of his own at Lewisburg, Pa.

C. M. Wing & Co., will succeed the firm of Wells & Dungan at Little Rock, Ark.

The Day Manufacturing Company, of Detroit, Mich., owing to their rapidly increasing business are compelled to add a new addition to their plant, which will be completed about February first. The business of this firm has doubled within the last year, and there are very flattering prospects for as great an increase during the coming year.

George H. Grindal has recently opened a plumbing and gasfitting shop in the Carter block at Jackson, Michigan.

R. J. Coggeshall and J. R. Ashton compose the new firm of plumbers at Milford, N. H. Their place of business is in the Eagle Hall building.

The old firm of Park & McKay Co., Detroit, Michigan, have opened up some beautiful show rooms at 55-59 Bagley avenue. Mr. McKay is a hustler and will make a trip soon throughout the West. This firm recently received an order from Victoria, B. C.

The Royal Army Sanitary Commission recently appointed in Great Britain will have about four million dollars at its disposal with which to improve existing barracks and to build new ones.

The Detroit Plumbers Supply Company has some very pleasant show rooms at 138 Larned street, where a full line of plumbers' and steam fitters' supplies are carried.

George Kolb will erect a plumbers' supply factory at Lonsdale, Pa., and will employ about fifty men in the new works.

Buick & Sherwood, of Detroit, are rushed with orders for their sanitary specialties. They will erect an addition to their plant which they hope to be occupying by the first of February.

Pittsburg Plumbers: Lawrence & Ricketts will do the work in a dwelling on Fillmore street and in three houses on Webster avenue; C. H. Jenks will plumb a house at 91 Diamond street and six houses on Centre avenue and Craig street; John M. Addy will fit up five houses on Negley avenue; two houses on Orabella street, and one on Highland avenue; W. W. Sauer & Bro. will do the work in two houses on Atwood street; Lawrence & Watson will fit up a house on Rippey street; one on Bond street, and another on Walnut street; Houston & McShane will plumb a building on Tannehill street.

The popular young firm of W. J. Burton & Co., of Detroit, Mich., is meeting with phenomenal success in manufacturing the Eastlake metal slates. Their recent shipments embrace the States of Virginia, West Virginia, North Carolina, Ohio, Mississippi, Texas, Missouri, Indiana and Michigan.

P. L. Lunberg has opened a plumbing shop at Rockford, Ill.

The recent fire at Owensboro, Ky., destroyed the plumbing shop of Cooley & York.

The master plumbers of Cincinnati, Ohio, are in a very thriving condition, and the association there is in healthy working order. This fact is of especial interest to the plumbers of the country, since it is this city that is to entertain the members of the National Association next June. The members of the Cincinnati Association are, therefore, preparing for this great occasion by giving banquets and vying with each other in speech-making. On November 25th the local association met at the Dennison Hotel, where a sumptuous table groaned with luxuries of all climes. After the repast, several hours were spent in listening to toasts and songs by the different members. The President, H. O. Collum, delivered his annual address, which was an able and masterly production. Among the familiar faces present were: H. McCullom, J. R. Gibson, Chas. Homan, Frank E. Hopper, Charles W. Murray, Wm. P. Carmichael, Matt A. Heyker, Wm. G. Wagner, Louis Felix. Wm, J. Gibson, M. Burke, Richard Murphy, Chas. H. Hicks, Chas. W. Atkins, James A. Gibson, Edward A. Dean, David W. Craig, Wm. G. Malden, Joseph Lawson, Wm. A. Allison, Edward J. Nolan, J. A. Dulleran, Charles Weber, Robert Carlisle, J. G. Murdock, M. Jones, George Douglas, Thos. McNeil, James A. Thompson, Thomas J. O'Hara, B. Wallerman, Ferd. A. Mentel, Jas. O. Gibson and Thomas Gibson.

R. E. Putnam will take charge of the plumbing business of the Kentucky Plumbing Company, at Louisville, Ky.

THE CHICAGO MASTER PLUMBERS.

A large number of the Chicago Master Plumbers assembled in Grand Army hall on Thursday evening, December 11th, for the regular bi-monthly meeting of the association. In the absence of the president, Mr. Hugh Watt, the vice-president called the meeting to order. A noticable feature of the meeting was the large number of new faces in the audience. The secretary, A. F. Irons, read the minutes of the previous meeting, which were adopted as presented. Mr. Wade, of the Sanitary Committee, made his regular report. A communication from the Journeymen Plumbers' Association was received and placed on file. Mr. Culloton, of the Special Committee, to consider the application of John Dalton reported favorably, and Mr. Dalton was elected a regular member of the association. A communication was read from H. M. Totten requesting that his name be dropped from the membership list of the association. A. J. Lawrence, of Portland, Ore., sent in a request for information on the apprenticeship question and the best method of securing a law to protect the plumbers. The subject was referred to the Apprenticeship Committee. Mr. Hamblin moved that when the association adjourn it adjourn to the second Thursday in January, 1891. The motion prevailed, and the next order of business was the nomination of officers for the coming year.

The names of P. Nacy, David Whiteford and William Bowden were placed in nomination for President. Mr. C. C. Bryer was called to the chair while Mr. Whiteford made an explanation to the association. Matthew L. Mandable, William Gay and T. P. Culloton were nominated for First Vice-President. Wm. Bowden was the only nominee for Second Vice-President. Mr. Frank Ruh and J. R. Alcock were nominated for Third Vice-President. Joseph O'Malle, Charles Lawrence and Mr. Hickey were nominated for Fourth Vice-President. Mr. Geo. Stokes was placed in nomination for Fifth Vice-President.

Mr. Hamblin moved that the incoming President select his own Secretary. Mr. P. Sanders was nominated for Treasurer. Matthew L. Mandable, J. J. Hamblin and Mr. Killian were placed before the association for Financial Secretary.

The formidable personage of Henry Negley was placed in nomination for Sergeant-at-Arms.

Mr. Griffith and several more of the members spoke on the necessity of having the Legislative Committee begin work at once to raise the requirements for admission to the plumbing profession.

A motion was carried to instruct the Legislative Committee to begin work at once toward securing a new law governing the granting of licenses to plumbers. The meeting then adjourned to the second Thursday in January.

ACTION OF AN INFUSION OF COFFEE ON BACTERIA.

The following concerning the germicidal action of coffee is translated from *La Rivista Internazionale d' Igiene.*

In studying the germicidal action of coffee Doctor Luderitz made use of infusions of different degrees of concentration, varying from 5 to 30 gr. of coffee to 10 c. c. of water.

He mixed from 4 to 6 drops of pure culture broth with 8 to 10 c. c. of this infusion, and at the end of a certain time he withdrew parts of this mixture and cultivated them in genatine. Experiment showed that the micrococcus prodigiosus dies in a 10 per cent. infusion of coffee in from 3 to 5 days, the bacillus of typhus in from 1 to 3 days, the proteus vulgaris in from 2 to 4 days, the staphylococcus aureus in from 4 to 7 days, the streptococcus of erysipelas in one day, the bacillus of cholera in from 3 to 4 hours, the bacillus of anthrax in from 2 to 3 hours, and the spores of anthrax in from 2 to 4 weeks.

In a 30 per cent. infusion of coffee the typhus bacillus dies in one day, the staphlococcus aureus in from 1 to 3 days, the bacillus of cholera in from one-half hour to two hours, the bacillus of anthrax in two hours, the spores of anthrax in from 2 to 4 weeks.

In a second series of experiments Luderitz studied the influence of an infusion of coffee mixed with gelatine on the development of bacteria. These experiments showed that the micrococcus prodigiosus does not vegetate in gelatine containing from 3 to 9 per cent. of coffee, the bacillus of typhus in gelatine with 3 per cent. of coffee, the proteus vulgaris with from 5 to 9 per cent., the staphylococcus aureus with 2 per cent., the streptococcus of erysipelas with 1 per cent., the cholera bacillus with 1, and the bacillus of anthrax with 0.6 per cent.

The action is the same for the different qualities of coffee, and is due not to the caffein, but the products of the roasting of the coffee.

THE ORTON PRIZE.

Dr. J. G. Orton, as President of the New York State Medical Association, has offered a prize of $100 for the best short popular essay on some subject conneeted with practical sanitation, under the following conditions:

1. Competition to be open to all.

2. Essays to be forwarded to the secretary of the association, Dr. E. D. Ferguson, Troy, N. Y., not later than August 1, 1891, accompanied by the name of the author under separate seal.

3. Examination and award to be made by a committee appointed by the council of the association.

4. The successful essay to be read at the next annual meeting of the association, and, if approved by the council, to be offered for publication in the secular press, and issued in tract form or otherwise for general circulation.

5. Authors of essays, unsuccessful as far as the prize is concerned, but found worthy of special commendation, to receive intimation as to a proper disposition to be made of them.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Olathe, Kan.: Washburne & Harris will make plans for a $50,000 court-house.——Salt Lake City, Utah: First South street, a five-story brick building; cost, $80,000. R. Bowman, architect. A six-story office building; cost, $300,000. Adler & Sullivan, architects.——Seattle, Wash.: Opera-house; cost, $350,000. Adler & Sullivan, Chicago, architects.——St. Louis, Mo.: A nine-story office building; cost, $500,000. Adler & Sullivan, Chicago, architects.—— St. Paul, Minn.: Trinity Church Society will build a stone and brick church on George street, near Waseca, to cost about $45,000.——Waltham, Mass.: E. S. Lexington, near Main street, a brick police-station and court-house; cost, $28,500. Hartwell & Richardson, architects.——Wheeling, W. Va.: N. Main street, four-story hospital addition; cost, $20,000. Joseph Leiner, architect.——Brooklyn, N. Y.: Hancock street, near Throop avenue, four two-and-a-half-story brick and stone dwellings; cost, $24,000. John E. Dwyer, architect. Oak street, near West street, a one-story brick coal pocket and boiler-house; cost, $20,000. Drew, Baldwin & Co., architects. Smith and Halleck streets, a three-story brick factory and boiler-house; cost, $60,000. Drew, Baldwin & Co., architects. Montrose avenue, near Bushwick avenue, three four-story brick flats; cost, $25,500. Thomas Engelhardt, architect. Third street, near Seventh avenue, a four-story brick flat; cost, $25,000. Geo. W. Miller, architect.——New York City: A. B. Ogden & Son have plans for eight brick and stone flats, to be erected on Eighth avenue, near 117th street, to cost about $225,000. Thom & Wilson have plans for three five-story brick and stone flats, to be built at Lexington avenue and Eighty-second street, at a cost of $80,000. 96 Henry street, a five-story brick flat; cost, $20,000. Charles Rentz, architect. Ninety-sixth street, near Ninth avenue, a five-story brick stable; cost, $35,000. Edward Wenz, architect. Seventy-fifth street, near Eighth avenue, seven four-story brick and stone dwellings; cost, $175,000. G. A. Schellinger, architect. 152 and 154 Franklin street, one seven-story brick store; cost, $35,000. John B. Snook & Sons, architects. 100 and 102 West Houston street, a six-story brick store; cost, $40,000. Charles Rentz, architect. 105th street, near Madison avenue, three five-story brick flats; cost, $21,000. John C. Burne, architect.——Dubuque, Ia.: A three-story store and office building. Edbrooke & Burnham, Chicago, architects.——Hammond, Ind.: D. S. Pentecost, Chicago, is preparing plans for a new depot.——Cincinnati, O.: Fulton avenue and Nassau street, five two-story dwellings; cost, $15,000. Fairfield and Lincoln avenues, Walnut Hills, two two-story brick dwellings; cost, $15,000. Shillito Chapel, Avondale, will be built by subscription; $8,000 already subscribed. Robert Laidlaw and Thos. McDougal are leaders in the movement. Miss Cook and sister, Mrs. Gaither, will build a 2½-story double brick dwelling on Myrtle avenue, Walnut Hills; cost, $15,000. Leopold Feis will build a 2½-story frame dwelling on Grand View avenue, Walnut Hills; cost, $15,000.——Cleveland, O.: The trustees of the School of Art of the Western Reserve are discussing the question of erecting an additional $50,000 building. ——Des Moines, Iowa: Foster & Liebbe, architects, have completed plans for a $100,000 office building for Conrad Youngerman. The Equitable Insurance Company, of New York, have in view the construction of a $250,000 office building in this city. A new court-house is sadly needed here, and steps are being taken to build one.——Detroit, Mich.: Woodard avenue, a three-story brick business block and hall; cost, $10,000. George W. Myers, architect. Pallister avenue, one-story brick manufactory; cost, $8,000. Malcomson & Higginbotham, architects. Warren avenue, near Third street, a two-story brick residence; cost, $7,000. Russell street, between Kirby and Ferry avenues, two-story frame residence; cost, $7,000. Jefferson avenue, a three-story frame hotel; cost, $7,000. Malcomson & Higginbotham, architects.——Galveston, Tex.: Avenue I and Twentieth street, Galveston Electric Railway power-house; cost, $20,000. N. J. Clayton & Co., architects.——Glencoe, Ill.: A frame dwelling; cost, $15,000. Flanders & Zimmerman, architects.——Louisville, Ky.; 550–554 Fourth street, a brick theater; cost, $100,000. M. McElfatrick, architect. The Board of Trade will make alterations in the Board of Trade building, at a cost of $10,000. J. F. Buckner, Secretary.——Madison, Wis.: A laundry building; cost, $10,000. Conover & Porter, architects.——Marion, O.: A brick and stone church; cost, $30,000. M. Verment, Massillon, O., architect.——Montrose, Ill.: A brick dwelling; cost, $10,000. Jul Speyer, architect.——New Haven, Conn.: Corner Union and Fair streets, a brick storehouse; cost, $15,000. Russell, architect. Hamilton, near Grand, a brick school-house; cost, $12,000. Corner Water and Hill streets, storehouse; cost, $15,000.——Decatur, Ill.: Oliver W. Marble, of Chicago, is preparing plans for a two-story residence, to be built by C. H. Brown,——Hinsdale, Ill.: Robert Rae, of Chicago, is making plans for a handsome residence for Harry Babcock.——Buffalo, N. Y.: Niagara street, corner Pennsylvania, a four-story brick and stone building; cost, $30,000. August Esenwein, architect. ——Canton, O,: Corner Woodland and Aultman avenues, a brick school; cost, $15,000. Guy Tilden, architect.——Denver, Colo.: Gallup street, between Fay and Ashland avenues, brick flats; cost, $40,000. Miller & Janisch, architects. Grant avenue, corner Tenth avenue, a brick store and flat; cost, $22,000. W. E. Meyers, architect. Gilpin, between Fourteenth and Colfax, a brick residence; cost, $20,000. J. J. Huddart, architect.——Osakis, Minn.: Superintendent Rice, of the Great Northern Railroad, will make arrangements for the building of a new depot.——Braintree, Mass.: The Old Colony Railroad Company is about to build a new brick roundhouse at the Union street crossing, to accommodate thirty locomotives.——Dubuque, Ia.: An additional story to the Julian House; cost, $25,000. W. W. Boyington, Chicago, architect.—— Chicago, Ill.: Robert Rae is preparing plans for an Episcopal church, to be erected at Englewood. Huron and Wells streets, a four-story store and flat building; cost, $25,000. Edbrooke & Burnham, architects. 3928 Grand boulevard, a three-story stone residence; cost, $15,000. R. G. Pentecost, architect. 3926 Grand boulevard, a three-story stone residence; cost, $15,000. R. G. Pentecost, architect. Clybourne avenue and Concord place, a three-story store and flat building. Huehl & Schwind, architects. St. Lawrence avenue and Seventy-first street, a two-story flat building. W. D. Cowles, architect. Cottage Grove avenue, near Twenty-eighth street, a four-story flat building; cost, $15,000. J. E. O. Pridmore, architect. 2428 Indiana avenue, a three-story dwelling; cost, $12,000. W. H. Drake, architect. Lake avenue, near Oakland boulevard, three three-story residences; cost, $35,000. Oliver W. Marble, architect. 3932 Grand boulevard, a three-story residence; cost, $25,000. R. G. Pentecost, architect. D. S. Pentecost is preparing plans for the following buildings: A two-story residence, to be erected at Prospect Park; cost, $15,000. A two-story residence, to be erected at Maple and School streets; a three-story flat building, to be erected on Oakley avenue, near Warren, and a two-story flat building, to be erected on the corner of Sixty-ninth street and Centre avenue.——Pittsburg, Pa.: The Iron City Brewing Company will erect a five-story brick brewery; cost, $65,000.—— St. Paul, Minn.: Cedar street, near Fourth street, a three-story brick and stone block of stores and offices; cost, $22,000.——Milwaukee, Wis.: Capt. Fred Pabst will erect a bank and office building, corner East Water and Wisconsin streets, to be built of pressed brick, with lower stories of granite, stone and terra cotta; cost, $400,000.——Detroit, Mich.: Architects Spies & Rhous are preparing plans for a brewery for Coppits, Muchers & Co., to be situated on the north side of Gratiot avenue, near Sylvester, to be 150x90, five stories in height, with brick and stone trimmings; cost, $50,000. Architects John Scott & Co. are preparing plans for a two-story residence for P. W. McAdow; cost $35,000. They are also preparing plans for a brick foundry and machine shops for the Peninsula Car Co., 217x180; cost, $135,000. Wm. Reed will build a 2½-story brick residence, with slate roof, to cost $7,000. A. C. Varney & Co. are preparing plans for same. Wm. Darmsteat, ter proposes to erect a three-story brick storehouse, 80x34, to cost $10,000. Mortimer Smith & Son are preparing plans for a two-story brick residence for Allen Brown; cost, $10,000; situated on Cass avenue, between Willis and Canfield. H. J. Zender has in course of erection a two-story double brick store and flats, at a cost of $5,000, 40x60, situated on the southeast corner of Gratiot and McDougall avenues. A. E. French, architect. John Clee will build a brick addition to his store and flour-mill, at the corner of Michigan avenue and First street, at a cost of $6,000. Plans prepared by A. E. French, architeet. Architects Hess & Raseman

are preparing plans for a brick and stone rectory for St. Paul's Protestant Episcopal Society, to have slate roof, 40x70; cost, $15,000.——Washington, D. C.: Architects Fava, Naeff & Co. are making sketches for a new music hall, which Mrs. W. G. Metzerott will build on the east side of Twelfth street, near F. It will be 80x101, with front of buff brick and white terra cotta, and will cost $80,000. Architect Leon E. Dessez is making plans for the power-house that the Rock Creek Railway Co. will build at the present terminus of their line in Montgomery county, Md. It will cost $75,000, and will be an L-shaped stone and brick building, with frontage of 130 feet and depth at longest point of 110 feet.——Coatesville, Pa.: The Presbyterian congregation will erect a new church building; cost, $35,000. Thomas P. Lonsdale, architect.

HEATING AND LIGHTING.

Chattanooga, Tenn.: The Chattanooga Electric Light Company contemplates making extensive improvements to its plant.——Palmer, Mass.: The Palmer Gas-Light Company is about to establish a plant. Estimated cost, $25,000. President, C. E. Fiske.——Paw Paw, Mich.: The city officials have decided to establish an electric light plant at once.——Mishawa, Ind.: The people of this place have decided in favor of establishing an electric light plant.——Manistee, Mich.: An electric light company has been organized, with Gen. G. A. Hart as its head.——Santa Fe, N. M.: An electric light plant is to be established by the Santa Fe Electric Light and Power Company. T. B. Catron can furnish particulars.——Philadelphia, Pa.: The Director of Public Works has been requested to advertise for bids for lighting the city by electricity.——Monroe, N. C.: The question of issuing $25,000 in bonds for lighting the town and street improvements will be voted on at an election to be held on December 18.—— Dallas, Tex.: The Dallas Electric Light Company will enlarge its electric plant, and for that purpose will issue $300,000 in bonds.—— Davenport, Ia.: All bids for electric street lighting recently received have been rejected, and the lighting committee has been directed to advertise again. The contract calls for 100 arc lights of 2,000 candle-power and 300 incandescent lamps of 32 candle-power, with the privilege of more of either kind at the respective price of the bid for each; the bids to be for three, five and seven years.——River Forest, Ill.: The proposition of the River Forest Water and Electric Light Co. regarding both water-works and electric lights has been referred by the village board to a special committee, consisting of A. J. Cost, president of the village board, F. J. Triffin, village attorney, and others.——Batesville, Ark.: The Batesville Water and Light Co. has filed incorporation papers, with Samuel B. Hartz, president. J. W. King and I. N. Reed are among the other incorporators. Authorized capital stock, $100,000.——Union, N. J.: Henry C. Heimholl has received a patent for water-heating attachments for ranges, which are applied independently of the water-back.——South Riverside, Cal.: Henry T. Knight has secured a patent for a universal steam joint. The device is applicable to the transmission of steam or fluid under pressure, where it is necessary to change the direction from time to time.

SEWERAGE NOTES.

Newark, N. J.: Numerous sewer extensions have been ordered in this city. Chairman Gaddis, of the sewer committee, can furnish particulars.——Chicago, Ill.: The drainage trustees have directed their engineer. Mr. Cooley, to suspend work upon the upper Desplaines river and below Joliet, to make additional surveys between Chicago and Summit, and to prepare his field notes so as to locate not less than one of the four routes for the main channel between Chicago and Summit.——Woonsocket, R. I.: The question of sewers is now being agitated.——Muscatine, Ia.: A company has been formed to reclaim a large tract of waste land near Muscatine, stretching from Drury's landing to New Boston. It is proposed to build a protecting levee and drain the ground, at a cost of $75,000. The tract is from 20 to 25 miles long, and stretches from the Mississippi to the bluffs, an average distance of 2 miles, comprising an area of 10,000 acres.——Gainesville, Fla.: It is probable that bonds for a sewerage system will soon be issued.——Harrisburg, Pa.: It is proposed to make an extensive addition to sewer district No. 2. Particulars can be had by addressing Mr. Pennebecker, of the Highway Committee.——Escanaba, Mich.: Charles F. Loweth, Consulting Engineer, Drake Block, St. Paul, Minn., has completed plans for a system of sewerage for Escanaba, Mich. Part of the work has already been completed, and proposals will soon be advertised for a submerged outlet, to cost several thousand dollars.——Davenport, Iowa: It is proposed to take immediate steps toward extending the local sewerage system. For particulars address City Attorney Fisher.——Ogden, Utah: Several important sewer extensions are to be made. For particulars address Alderman Shilling.——Toronto, Ont.: City Engineer Jennings, in his last report to the Board of Public Works, recommends the construction of additional sewers, at a total expenditure of $17,900.——Holley, N. Y.: A system of sewer filtration will be established.——Albion, N. Y.: Steps are being taken toward establishing a system of sewage filtration.——Beverly, Mass.: It is probable that important steps will soon be taken toward establishing the projected sewerage system. Henry P. Moulton can furnish particulars.——Rochester, N. Y.: An expert engineer is to be employed to make investigations and report to the common council on the east side sewer project. Alderman Lempert can furnish particulars.——Quincy, Mass.: The city council has adopted the report presented by the sewer committee.——Waltham, Mass.: The city has adopted a report of the sewer commissioners, providing for an appropriation of $300,000 for the completion of the sewer system.——Belfast, Me.: Plans for a complete system of sewers have been prepared by Wheeler & Parks, Boston, Mass. The cost is estimated at between $45,000 and $50,000.——Washngton, D. C.: Supt. McComb, of the sewer division, has presented his annual report. There are still a number of defective pipe sewers which were built before 1874. An appropriation of $35,000 for the construction of sewers under the permit and compulsory permit system is recommended for 1891.——Columbia, S. C.: A sewerage commission, composed of Aldermen Dunn, Sloan and Brennen has been appointed to have surveys and estimates made for a system of sewers.——Knoxville, Tenn.: The plans prepared by Col. Hartford, of Chattanooga, and approved by Mr. Nicholson, the city engineer, provide for a sewerage system to cost about $244,000. The system includes West and North Knoxville and Elmwood, and the part for the city will cost $175,000.——Mobile, Ala.: The council has adopted the report of the committee on sewerage and paving of the city. It provides that when more than half the property owners on any street agree that sewerage or paving is necessary the city may proceed to pave and lay sewerage pipes and charge each their proportion of the expense. Should the parties fail to pay, their property is to be held liable. Accompanying the report is a blll to be presented to the legislature at its present term.——Columbus, Ohio: Ordinances have been passed providing for the issue of $20,000 in bonds for main trunk sewers on Wall and Third streets.——Oak Park, Ill.: The Drainage Committee of the Town Board will confer with the Chicago Drainage Committee in regard to Cicero sewers and the future main outlet.——Galveston, Tex.: The city will spend about $500,000 on sewer work:——Sault Ste. Marie, Mich.: The sewer work for the next season will probably be limited to the construction of about 1,200 feet of sewers with three manholes.——Bucyrus, Ohio: About one mile of sewer extension will be built next season. It will be of egg-shape pipe, from 12 to 20-in. diameter. The Star sewer drop will be used, with 9x12-inch P traps; manholes furnished with iron ventilating covers. About 100 of these inlets are in use and are found a success.——Sheffield, Ala.: Contracts are reported to have been let for the construction of a system of sewerage.——Birmingham, Ala.: The city will apply to the legislature for authority to issue bonds for $150,000 for sewers and street work.——Wilmington, N. C.: An ordinance has been adopted providing that no sewers must be laid without the consent of the Board of Aldermen, and in conformity with sanitary regulations; the work to be under the direction of the City Surveyor.

WATER-WORKS NOTES.

Minneapolis, Minn.: The water-works committee of the city council, in accordance with the recommendation of Registrar Moody, nearly a year ago, has instructed him to prepare estimates of the cost of water meters placed in general use throughout the city.——St. Paul, Minn.: Additions will be made to the water-works system of South St. Paul.——Sioux City, Iowa: The city

council has reconsidered the action awarding the contract for a temporary water-works plant to Godfrey Brothers.——Dayton, Wash.: The sum of $75,000 is to be expended in establishing a system of water-works.——Ocean Springs, Miss.: A complete system of water-works is to be established. The town clerk can furnish particulars.——Bridgeport, Ala.: Works costing $65,000 will be built.——Sheffield, Ala.: The city will apply to the legislature for authority to issue $150,000 of water-works bonds. Messrs. Johnson & Flad, St. Louis, Mo., were employed last summer to report on works.——Cleveland, Tenn.: Address J. L. Young regarding contract for works to supply 5,000 people.——Harrodsburg, Ky.: Bids for the construction of works are wanted by W. K. Cardwell, mayor.——DuQuoin, Ill.: The search for a water supply has been successful, a plentiful supply having been struck about 1½ miles from town.——Davenport, Iowa.: The Davenport Water Company, after six months investigation on the part of its secretary and manager, J. P. Donahue, of the question of filtration and filtering plants, have voted to increase their capital stock $300,000, the proceeds to be expended in extensions and the construction of an extensive filtering plant, the source of their supply being the Mississippi river. The cost of the filtering improvements are stated to be in the neighborhood of $150,000. Of the other projected improvements two boilers are to be added to the pumping station, each 66 inches by 20 feet long. ——Fairport, N. Y.: It is probable that a system of water-works will be established.——Blue Springs, Neb.: The city will vote, December 30th, on a proposition to bond the town in the sum of $8,400 to build water-works.——Canton, S. D.: At an election held at this place November 25th, the people voted in favor of establishing a system of water-works. Mayor John Zeller has the matter in charge.——Brooklyn, N. Y.: A certificate of incorporation of the Blythebourne Water Company has been filed. The company is to supply water in the vicinity of Blythebourne, New Utrecht. The trustees are Richard B. Fithian, Thomas S. Sands and others.——Argonia, Kan.: A special election is to be held to decide the question of establishing a system of water-works.——Gainesville, Fla.: It is proposed to issue bonds in a sufficient amount to enable the officials to establish a system of water-works.——La Harpe, Ill.: The taxpayers have decided to establish a system of water-works at once.——Valdosta, Ga.: It is probable that a system of water-works will be established in the spring.——Sturgis, S. D.: A company has been organized for the purpose of establishing and maintaining a system of water-works. Albert H. Harris is interested in the project.——Meriden, Conn.: Bids will soon be wanted at this place for a new 20-inch iron main and a new dam. Mayor Page can furnish particulars. ——Knoxville, Tenn.: Among the improvements projected to the water-works system of this place is the doubling the capacity of the reservoir service, putting in new and larger mains, the addition of new pumps having a daily capacity of about 8,000,000 gallons, and the removal of the pumping station. Col. Hartford can furnish particulars.——Fort Worth, Tex.: The charter of this city has been so amended as to give the officials power to increase the bonded indebtedness of the water-works to $1,000,000, the funds so raised, however, not to be diverted to any other purpose.——Sacramento, Cal.: The pumping plant of the city water-works is insufficient, and a number of engineers who investigated it report that an additional pump must be put in. The total cost of the improvement is estimated at $40,000.——Batesville, Ark.: The Batesville Water and Electric Company has filed articles of incorporation, with a capital stock of $100,000. Samuel B. Hartz, president. The company is incorporated for the purpose of erecting, constructing, operating and maintaining water-works and electric light systems.——San Francisco, Cal.: The American Land and Water Company has been incorporated. The purposes of the company are to buy and sell water rights and real estate, and to carry on the business of a water company in San Mateo and Santa Clara counties, and supply cities, counties, villages and incorporated towns with water. Capital stock, $200,000. Timothy T. McCarty, Edwin Windele and Frank M. Cartan, of San Francisco, are interested.——Murfreesboro, Tenn.: A company is about to be organized with a capital stock of $20,000, for the purpose of constructing water-works.——Norfolk, Va.: The common council, on Dec. 2nd, appropiated the additional $14,500 for pumps and apparatus for the water-works pumping station. President Hodges, of the common council, can furnish particulars.——Cresco, Minn.: This town has voted to have water-works built.——Butte, Mont.: Papers have been signed for the construction of a water-works system, to cost $2,000,000.

BIDS AND CONTRACTS.

Terre Haute, Ind.: Proposals are wanted until December 20th, for the erection of a new depot. Address George E. Farrington for particulars.——Kansas City, Mo.: Proposals are wanted until December 22nd for doing certain work at the City Hall. Address S. E. Chamberlain, Superintendent of Buildings.——Brooklyn, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 18th day of December 1890, for all the labor and material required for the approaches to the U. S. post-office, etc., building at Brooklyn, N. Y., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Brooklyn, N. Y. Jas. H. Windrim, Supervising Architect.——Toronto, Can.: Tenders will be received by registered post, addressed to the City Engineer, Toronto, up till noon on Tuesday, December 23d, for supply of pipe for year ending December 31st, 1891. Specifications and forms of tender can be obtained on and after the 1st of December at the City Engineer's office. John Shaw, Chairman, Committee on Works. Winston, N. C.: Sealed proposals will be received by the Mayor and Board of Aldermen of the city of Winston, until 2 o'clock P. M., of Monday, December 22, 1890, for furnishing about four miles of sewer pipe, from 6 to 24 inches diameter, and fittings for same. Specifications, approximate quantities, etc., may be obtained from the Chairman of the Sewerage Committee or the Engineer. J. W. Allspaugh, Chairman Sewerage Committee, J. L. Ludlow, Engineer.——Cincinnati, O.: Sealed proposals will be received at the office of the Board of City Affairs, until 12 o'clock noon of December 26, A. D. 1890, for four vertical pumps of 5,000,000 capacity each in 24 hours. These pumps to take the place of similar size Wetherill pumps now in position, and to operate by the steam ends now in use. Each bidder is requested to examine and measure the well, and so design his work as to properly connect with the parts to be retained. Each bidder will be allowed to furnish his own plan, drawings and specifications, with guarantee as to date of completion, and forfeiture for failure in time; also will be required to give proposition on plans and specifications furnished by the Board of City Affairs. For particulars apply to Willis P. Tharp, Superintendent and Engineer of Cincinnati Water-Works. Thomas G. Smith, President. D. W. Brown, Clerk B. C. A.——Lowell, Mass.: Sealed proposals, indorsed "Proposals for Pumping Engine," will be received at the office of the Lowell water-works, City Hall, until 2 P. M. on Friday, Jan. 16, 1891, for the construction, delivery and erection of a 10,000,000 gallon steam pumping engine for the city of Lowell, Mass., and at that time will be publicly opened and read. Specifications will be mailed upon application to water-works office, City Hall, Lowell, Mass. Other information may be obtained upon application to Lowell Water Works Office, or from George H. Barrus, M. E., 95 Milk St., Boston, Mass. John Stott, Miles F. Brennan, Edward W. Thomas, Committee on New Engine of Lowell Water Board.——Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 22d day of December, 1890, for all the labor and materials necessary to complete the approaches, mailing platform, post office lookout, etc., for the U. S. Court House, and Post Office building, at Pittsburg, Pa., in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the superintendent at Pittsburg, Pa. Jas. H. Windrim, Supervising Architect.——Louisville, Ky.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 5th day of January, 1891, for all the labor and materials required for the approaches to the U. S. Court House, Post Office, etc., building, at Louisville, Ky., in accordance with the drawing and specification, copies of which may be had on application at this office, or the office of the Superintendent. Jas H. Windrim, Supervising Architect.——Pittsburg, Pa.: Sealed pro-

posals will be received at the office of the City Controller until 2 o'clock P. M., on Friday, December 26, 1890, for the erection of a Garbage Furnace, on lot owned by the city of Pittsburg, on River Street, 19th Ward. Specifications and all information can be obtained from Charles Bickel, architect, Hamilton building, 91 and 93 Fifth Avenue. J. O. Brown, Chief, Department of Public Safety.——Frankfort, Ind.: Proposals are wanted until December 19 1890, for lighting, by electricity and gas, the public streets, etc., of Frankfort, Ind., for a period of five years. Address S. A. Cook, City Clerk.——West Point, N. Y.: Sealed proposals, in triplicate, subject to the usual conditions, will be received at this office, until 12 o'clock noon, on the 3d day of January 1891, for the erection of a brick Cavalry Barrack as per plans and specifications, to be seen at this office. Inclose proposals in envelope marked "Proposals for Erection of Barrack," and addressed to the undersigned, W. H. Miller, Captain and A. Q. M. U. S. A.——New York City: Proposals are wanted until December 31, for lighting by electricity certain streets of this city. Address the Gas Commission, Department of Public Works.——Winston, N. C.: Sealed proposals will be received by the Mayor and Board of Aldermen of the city of Winston at the Mayor's office of said city, until 2 o'clock P. M. of Friday, January 2, 1891, for constructing a part of the proposed system of pipe sewers for said city. Copies of general plans and specifications, forms of proposals and instructions to contractors, and any information relative thereto may be obtained from the Chairman or Engineer of the Sewerage Committee. J. W. Allspaugh, Chairman, Sewerage Committee, J. L. Ludlow, Engineer. ——Detroit, Mich.: Sealed proposals will be received at this office until 2 o'clock P. M. on the 18th day of December, 1890, for all the labor and materials required in the construction and completion of the Fort Street Union Depot building at Detroit, Mich., in accordance with the drawings and specifications thereof. The work will include excavation, drainage, concrete and stone mason work, cut stonework, brickwork, concrete and asphalt floors, plastering, carpenter and joiner work, painting and glazing, wrought and cast iron work, sheet metal work, terra cotta work, slate and other roofs, marble work, plumbing, steam heating, gas and electric work, etc. All information in regard to drawings and specifications can be obtained from James Appleyard, Superintendent of Construction, at Room 525 Hammond Building, Detroit, Mich. Proposals must be inclosed in an envelope, marked "Proposals for Union Depot," and addressed to the company. Henry B. Joy, Secretary.——St. Johns, N. F.: Application for the position of Town Engineer will be received by the undersigned up to the 18th day of December next. Applicants are required to state the salary they expect and give a concise epitome of their professional experience and municipal works on which they have been engaged. Not more than five testimonials to accompany each application. Traveling and personal expenses to St. John's will be paid by the Municipal Council. Salary will commence from date of arrival in St. Johns. P. W. Kelley, Secretary Municipal Council.——Americus, Ga.: Proposals are invited for sinking an artesian well at Americus, Ga. Two flowing wells in city at same level. For particulars address J. B. Felder, Mayor.—— Pittsburg, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 17th day of December, 1890, for all the labor and materials required for concreting the floor of basement, etc., of U. S. Court House and Post Office at Pittsburg, Pa., in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Superintendent, at Pittsburg, Pa. Jas. H. Windrim, Supervising Architect.——Detroit, Mich.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 17th day of December, 1890, for the iron beams, etc., for the first floor, basement columns, etc., for the U. S. court-house, post-office, etc., building, at Detroit, Mich., in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the superintendent at Detroit, Mich. Jas. H. Windrim, Supervising Architect.

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HOLIDAY RATES.

WABASH AND NIAGARA FALLS SHORT LINE.

For the Holidays the Wabash Railroad will sell tickets to all local stations on the system, and to Niagara Falls, Buffalo and Canadian points, at a fare and one-third for the round trip, on December 24, 25, 29 and January 1. The returning limit on tickets to Detroit and all other local stations will be January 5; from Buffalo, Niagara Falls and Canadian points, the returning limit will be January 3.

HOLIDAY EXCURSION RATES.

The Chicago & Grand Trunk Railway, Cincinnati, Saginaw & Mackinaw R. R., and the Michigan Air Line and Detroit Division G. T. Ry. have arranged to sell special holiday excursion tickets at one and one-third fare between stations on their lines and also to points on Detroit, Grand Haven & Milwaukee Ry., and Toledo, Saginaw & Muskegon Ry., under the following arrangement:

Christmas tickets will be on sale from December 24th to December 25th, inclusive, and good to return up to and including Jan. 3rd, 1891.

New Year's tickets will be on sale from December 31st, 1890, to Jan. 1st, 1891, inclusive, and good to return up to and including Jan. 3rd, 1891.

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A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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THE best of plans for plumbing, with the best of material and sanitary appliances, will avail nothing unless the plumbing work is of the highest order. It, therefore, stands the plumber in need to keep abreast with the times in the perfection of his workmanship.

A SENTIMENT has been expressed in England in favor of registered builders, as well as registered plumbers. The suggestion is a good one, and reasons for a similar demand exist in this country. As the matter now stands, the builder is directly responsible for a great amount of indifferent plumbing work. It is true that there are many men in the plumbing business who will not do the kind of work required by the general speculative builder and others who do poor work; yet it is equally true that there are alleged plumbers who will do such work as long as there is a demand for it. A remedy for this evil lies in the registration and certification of only competent and responsible builders. Besides, there are other considerations in building construction than plumbing which are material to health, and which demand the services of thoroughly reliable builders.

THE Health Committee of Birmingham have resolved that "illness and death did occur, and were constantly occurring, through defective plumbing," and want to make the plumbers their technical assistants. This was the expression of one of the committee at a public meeting. There was also, at the same meeting, a public demand made for plumbers for sanitary inspectors. Healthy and proper sentiments regarding the relation of the plumber to sanitation are rapidly growing, and the results already can be found in the decreasing death-rates of our cities.

BAD plumbing in a dwelling means bad air, bad water, bad drainage and bad health. There is no economy in any kind of poor work, and especially in that of plumbing. Bad plumbing not only subjects the house-owner to constant expense for repairs, but subjects the inmates of such dwelling to the expense of doctor-bills and the miseries of ill-health. Economy in plumbing can only be found in employing competent and responsible workmen and in procuring the proper material and sanitary appliances. This will be fonnd a guarantee against continual expenditures for repairs, and a protection against the cost and suffering of disease. These facts are recognized and published by high medical and scientific authority, and it is but a mark of ignorance and littleness to dispute them.

REGISTRATION AND THE PLUMBING TRADE.

At a recent meeting of the District Council for Glasgow and the west of Scotland for the promotion of the national registration of plumbers, the chairman, Mr. Crawford, outlined a bill in which he had taken an active part in promoting in Parliament. He stated that the bill, besides its general public interest in promoting health, would effect the trade in five particular points: First, in reference to the system of open privies, which existed in a great many parts of the city. Frequently those with ashpits occurred in the center of a square of dwelling houses, an arrangement which was a disgrace to civilization, and a standing source of demoralization. With regard to that, the town was asking power to do away with these open privies and ashpits, and to make it compulsory that proper water closet accommodation should be provided somewhere convenient to the smaller class of dwelling houses throughout the city. The town was successful in carrying that, and of course there would be a great deal of plumber work to be done in supplying water closets to these smaller houses. The second point was in connection with cisterns. The town asked powers to make it illegal to keep cisterns for drinking and other domestic purposes where these cisterns were exposed to contamination, and they wished that all such cisterns should be done away with, so as to make it perfectly certain that every one would have good water to drink. The third point in which the bill interested plumbers was that powers were asked to authorities for testing drains, not only where these were defective, but also where there was a reasonable suspicion that they were not efficient. They had a very severe tussle with Lord Morley, the examiner of bills in the House of Lords, as to this. He urged that the Englishman's house was his castle; that if his drains were out of order it was his own lookout, and that the authorities had no right to go into his house without his consent. Their reply to that was that the Englishman very seldom dwelt in his house alone. He had a wife and very frequently children and servants, perhaps visitors, and sometimes even lodgers. Though he might claim a right to poison himself, yet he could not be allowed to poison the other inmates of the house. Disease was propagated through improper drainage. The evil could not be confined to the individual smitten with disease, who was frequently a centre of propagation of the disease to others. Sewage gas could not be confined to one particular place, and was likely in tenements of dwelling houses to spread all over the building. In the case of tenements they were able to get what they asked, so that on the complaint of any individual tenant they could now make a test and see if the drains were in order. Some concessions were made to English ideas, and it was agreed that where a man occupied a house by himself they were not at liberty in that case to test the drains without his consent or the authority of a magistrate. There was thus a considerable extension of power allowed in the direction of calling in that inevitable agent of health, the plumber. The next

point was the power which was now given to the Dean of Guild Court to step in wherever any house was being made down from a larger to a smaller occupancy. Now, a great many houses were made down from five or six rooms to single apartments without any sanitary arrangements. These arrangements cannot be done without the plumber. With regard to houses that were already insanitary the Dean of Guild Court could not interfere, but they had now power to close them up. Although as yet nothing material has been done, the bill which was passed last year had a very great effect upon the plumbing trade of Glasgow. One of the points that was strongly urged against them was that those outside conveniences, though often a danger and a snare, were yet a great deal more healthy outside than imperfect ones inside. They were able to repel that charge. But there must have been some foundation for it, and it was for the plumbers and those connected with the registration movement to make every reproach an impossibility in the future. He quite understood that that movement, which was having a remarkable success, was not a modified trades union, nor was it an attempt specially to benefit the trade, whether masters or workmen. All, no doubt, would ultimately be benefited by the movement, but he was aware that plumbers themselves recognized the primary consideration to be the public health. If the status of the plumber as a workman was to be raised, if he was to have the full confidence of the community, if he was to have ultimately a higher standard of payment because of a higher standard of skill, if he was to have the recognition of Parliament, that was because with him public health was the first consideration. The responsibility for good work being placed in the hands of the plumber, he must rise to the discharge of it without the idea that it would benefit his pocket, and in proportion that he did so, would the registration movement take a firm hold?

THE KOCH TREATMENT.

All kinds of opinions are generally heard regarding a new discovery or invention, especially when it is so important and far-reaching as the new treatment for tuberculosis announced by Prof. Koch. There have been numerous reports published regarding the results of this treatment, some favorable and some unfavorable, all demonstrating the fact that it will require time to establish the true merits of the lymph as a remedy for phthisis. It is not astonishing that the whole world should be impatient regarding the treatment for a disease that destroys more lives than sword and pestilence. Epidemics of cholera, yellow fever and such deadly diseases are as nothing compared with the mortality from consumption, and the excitement, enthusiasm, and wild rumors regarding this new remedy are perfectly natural.

A dispatch from London gives an interview with Prof. Virchow, one of the foremost pathologists of the world, in which that savant speaks as follows in reference to Prof. Koch's lymph.

"It is quite absurd to know that doctors in all parts of the world are about to inject a powerful poison into the bodies of men before Koch has made known the results of large or long-continued doses upon animals. It is highly dangerous and indiscreet to have an unknown, untried fluid used by the unexperienced. I cannot express an opinion as to the reason why the lymph only effects the tissues inhabited by the bacilli until Dr. Koch tells what it is made of. We must have the tuberculosis tissue taken from a living patient before the lymph treatment, and the tissue taken from the same spot after the treatment, in order to judge what the action is. Otherwise we may mistake the changes caused by the disease itself for changes caused by the lymph. The best clew I have found to the real action of the lymph is in cases of tuberculosis affection of the larynx. Under ordinary treatment tubercles form on the edge of the vocal bands and are finally detached, leaving behind them ulcers which we can readily heal. But the difficulty has been that these tubercles develop so slowly that by the time one set of tubercles detach themselves another set has sprung in another spot. Dr. Koch accelerates growth that segregation of tubercles in the larynx so greatly that they are full of growth and detached so quickly that before new ones appear we can heal the whole larynx.

"It is clear to me that the lymph is dangerous for children and persons in advanced stages of phthisis. In the case of children it brings on perilous inflammation of the lungs, and in advanced phthisis it is apt to destroy the lungs. In cases of tubercular meningitis the fluid is likley to cause fatal inflammation of the brain tissues. No doubt the remedy brings on astonishing changes. As for tuberculosis of the lungs some cases in the early stages of the disease show slight improvement. The patient claims he feels better, his weight improves, and there is less sputum. But my opinion of these results is mostly psychological. The patient is stimulated by the knowledge that he is receiving a new remedy which is said to be a quick cure. No tests made now in this time of excitement are worth much. We must have a period of quiet before the real search for results can be made, for patients must be in normal condition. It will take a year or two before we can tell whether Dr. Koch's remedy is effective in phthisis. It is possible that by careful experimenting two or three years we may be able to use this lymph successfully with a combination of some other compound, and so conquer phthisis in its first forms."

In connection with the above, a statement by Dr. Loomis is worthy of note. He says:

"I was skeptical at first, but now consider the lymph the greatest medical discovery of modern if not of all times. I saw yesterday in Dr. von Bergmann's private wards an Englishman cured of nine years' lupus with sixteen injections—less than one-eighth of a drop of lymph diluted. All around me were cases of wonderful cures. Prof. von Leyden, the great internal medico, told me he would use the lymph on his own child if the occasion necessitated it. He noticed an improvement in all advanced cases of lung tuberculosis."

Dr. Loomis said every drop of the fluid was worth at least $1,300, as a diluted drop will furnish over 130 injections, and any reputable American physician can get $100 each injection. As a vial contains about sixty drops, its present actual commercial value is $78,000. The doctor said a drop was worth three times more than a fine diamond of the same size. A means that will save a life is worth whatever that life is worth from one point of view, but the new remedy, in order that it may accomplish that which is prophesied of it, must be placed within the reach of all. The communicable nature of tuberculosis is such that, to efface it from among the scourges of humanity, it must be reached by the remedy in the hovel as well as in the palace. The lymph will fail in its predicted mission unless it fill its great office with the completeness of vaccination for the prevention of small-pox.

NOTES AND NEWS.

A glass manufacturer has succeeded in producing glass plates of great breadth, and any desired length, by means of rolling.

A little borax, put in water in which scarlet napkins and red-bordered towels are to be washed, will prevent them from fading.

Oil of peppermint in water, diluted even to one part in one million, will kill cockroaches in an hour, they dying of convulsions.

A small box filled with lime, and placed on a shelf in the pantry or closet, will absorb dampness and keep the air in the closet dry and sweet.

A self-igniting cigar has been invented. A fulminating substance is placed in the lip, and a light produced by friction, after the manner of an ordinary match.

Dissolve a few pearl buttons in the juice of a lemon, a creamy ointment will he produced in a few days, and this applied on a rag for a few days is a perfect cure for corns.

Dry ropes immersed for four days in a bath containing twenty grains of sulphite of copper to a quart of water, are for some time preserved from the attacks of animal parasites and rot.

It has been proposed to make the upper half of war balloons of very thin steel, and the lower portion of ordinary balloon material, the whole so constructed as to hold hydrogen instead of ordinary gas.

The most recent observations as to the amount of heat the earth receives from the sun show that in clear, pleasant weather, 63½ per cent. of heat is absorbed by the atmosphere, and only 36½ per cent. reaches the soil. This figure rises in October to 41 per cent., and sinks to 28 per cent. in January.

Just as a right education is a preventive of crime, and cheaper than the machinery for its detection and punishment, so is sanitation a preventive of disease, and cheaper than the appliances for its cure.—*Hon. John Eaton.*

Whiskey will take out every kind of fruit-stain. A child's dress will be entirely ruined by the dark berry-stain on it, but if whiskey is poured on the discolored places before sending it into wash, it will come out as good as new.

A certain amount of air admitted to the furnace above the live coal is advantageous rather than otherwise, if the supply be regulated. The oxygen of the air, thus introduced, assists in the more effective combustion of the gases.

Black Sea soundings are said to show that below the depth of 600 feet the water is so impregnated with sulphurated hydrogen gas, emanating from decaying animals and vegetable matter, that living organisms are not found there.

The French medical journals have lately told of another instance in which diphtheria appears to have been transmitted from animals to man, this time from pigeons. One of these birds died, and the veterinary surgeon found post-mortem that diphtheria had been the cause of death. From this bird, his owner, his daughter and a child were infected.

A steel color is developed on brass by using a boiling solution of arsenic-chloride. A concentrated solution of sodium sulphite causes a blue coloration. Black, as on optical instruments, is obtained from a solution of platinum-chloride, to which tin-nitrate has been added. In Japan brass is bronzed by using a boiling solution of copper sulphate, alum and verdigris.

To make an impermerble glue, soak ordinary glue in water until it softens, and remove it before it has lost its primitive form. After this dissolve it in linseed oil over a slow fire until it is brought to the consistence of a jelly. This glue may be used for joining any kinds of material. In addition to strength and hardness, it has the advantage of resisting the action of water.—*Revue Industrielle.*

Philadelphia manufacturers have a process for coating all kinds of metallic substances with lead, thereby making them rust-proof. They exhibit a number of articles coated with lead that have been exposed to the weather and immersed in acids, that do not show any change, either from the action of the weather or the acids. Some shingle-nails, so treated, placed side by side with galvanized nails and exposed for a time, show no appreciable change, while the galvanized nails show signs of rust.

Sanitary administration means not only personal comfort and health in the family, but economy to the state and family. Two hundred and fifty thousand lives lost, three million cases of sickness and $20,000,000 in money are traced, in one decade in England alone, to neglect of sanitary care. The sword and the musket are terrible ministers of death, but even in armies, where battles kill one person, disease kills at least three.—*Hon. Erastus Brooks.*

According to Dr. Leuf, when water is taken into the full or partly full stomach, it does not mingle with the food, as we are taught, but passes along quickly between the food and lesser curative toward the pylorus, through which it passes into the intestines. The secretion of mucous by the lining membrane is constant, and during the night a considerable amount accumulates in the stomach; some of its liquid portion is absorbed, and that which remains is thick and tenacious. If food is taken into the stomach when in this condition, it becomes coated with this mucous, and the secretion of the gastric juice and its action are delayed. These facts show the value of a goblet of water before breakfast. This washes out the tenacious mucous, and stimulates the gastric glands to secretion. In old and feeble persons water should not be taken cold, but it may be with great advantage taken warm or hot. This removal of the accumulated mucous from the stomach is probably one of the reasons why taking soup at the beginning of a meal has been found so beneficial.

It is a pretty well-known fact that when hungry or tired, one is more apt to take scarlet fever and other infectious diseases than after an easy day and a good dinner. Experimental observations have recently been made by some Italian observers, which are spoken of in the *Hospital Gazette*, and which tend to show that hunger may play a very important *role* indeed in the spread of infectious diseases. Pigeons and fowls are not usually susceptible to the infection of malignant pustule or charbon. When, however, pigeons were kept without sufficient food for several days, both before and after inoculation with charbon virus, they became susceptible to the disease, and died from it like other animals; and when they were kept without sufficient food for some days before inoculation, and for two days only afterwards, food being then supplied in proper quantity, the disease, though not prevented, was visibly affected, its course being much more chronic than when the birds were kept hungry for a week or more after inoculation. Another interesting point observed was that if an ordinary well-nourished and therefore insusceptible pigeon was inoculated, and complete starvation commenced eight days later, the disease appeared showing that the charbon virus, though stored in the subcutaneous tissues of an insusceptible animal, retains its virulence for several days. Some experiments were likewise made on pigeons, from which the pancreas had been partially or entirely removed. These appeared to become susceptible to the charbon virus for some time after the operation.

MICROBES IN AIR, WATER, SOILS AND FOODS IN RELATION TO INFECTIVE DISEASES.*

[Continued from Page 64.]

MICRO-ORGANISMS IN AIR.

An attempt has been made, by estimating the number of micro-organisms in air, to form definite opinions regarding the organic impurity present, and for this purpose measured quantities of air are drawn through glass cylinders provided with the necessary food for microbic life, the organisms are deposited on the nutrient surface, and in a few days grow and develop, and the number of colonies can then be counted. The most useful method for this purpose is Hesse's. The actual relationship of number of colonies and quantity of organic impurity, however, depends on various other considerations, which must be taken into account, such as temperature, moisture and air currents. By the elaborate experiments at Dundee, carried out by Carnelley, Haldane and Anderson, a great deal of information has been gained, for not only did they find that in the air of the one, two and three-roomed house, was there a direct relationship between numbers of micro-organisms and organic impurity, but that in schools mechanically ventilated, as distinguished from those naturally ventilated, the proportion of microbes in the former to those in the latter condition was about 1 to 9. In schools, if the air was still, the numbers were small, while movements and stamping of the feet increased the numbers, this being due to disturbance of microbes, which had gravitated to the floor. For full particulars about these investigations, this valuable paper should be consulted (transactions of the royal society, 1886). In sewers Haldane and Carnelley found new microbes, and the explanation of this is, they gravitate into the sewage.

From my own experiments on the air of coal mines, I found that many varieties of microbes were to be found, but not always in a proportion indicating close relationship to amount of organic impurity present.

Nageli has shown that strong currents are unable to detach bacteria from moist surfaces; and only when there is a spurting up of a fluid by waves, or by agitation of water, such as by a mill-wheel (or the paddles of a steamer), that particles of water with contained organisms can be carried by currents of air for short distances. This is of great consequence, from the fact that the bacillus of cholera is destroyed by drying, and cannot readily be carried by air, except in the conditions above stated, and further explains why cholera rarely passes over sandy deserts. The seasonal prevalence of typhoid may be explained in part by its bacillus becoming dry and volatile, is detached from liquids and moist surfaces, and is conveyed by aerial currents. Isolated cases of typhoid, without any apparent defective sanitary conditions, may, and do, undoubtedly occur from this cause. In a paper in the Edinburgh *Medical Journal* many years ago, I pointed out this as an important factor in the occurrence of isolated cases.

*Read at the Sixteenth Annual Meeting of the Sanitary Association of Scotland, held at Perth, July 24, 1890, by T. G. Nasmyth, M. D.

MICRO-ORGANISMS IN WATER.

The numbers of colonies on "plate cultivations," from a measured quantity of water, have a most direct relationship to the amount of organic impurity present, but subject to a great many important determining factors—such as the length of time the water has been stored, the temperature of the water, and the air. From my own experiments on an extensive scale, for instance in Loch Katrine water, the number of colonies in a fixed quantity varied only slightly, and never exceeded more than 27; while in a water associated with an outbreak of enteric fever, the colonies were so numerous that they could not be counted. And by using sterilized distilled water, and adding to two samples, in one case 1 gr. of organic impurity, and to the other two grs., I got respectively 20 and 42 colonies.

At this time I wish, however, to consider the subject of microbes in water from their relationship to actual disease production, and to point out the conditions acting for and against this occurrence. Epidemics of cholera and typhoid fever have been repeatedly traced to polluted water supplies. The question before us now is—do the various biological conditions of the micro-organisms concerned with these diseases agree with these well-known facts, we might call them laws? It has been proved by numerous experiments that microbes are to be found in water, however pure, and the more organic impurity the greater number of organisms will be found. We must admit, as a premise, that water is a suitable medium for the growth of ordinary microbes, and we will now discuss the subject of actual disease-producing forms.

The question of pathogenic organisms and water has been the subject of very extensive laboratory experiments; and it may at once be stated that these do not exactly represent the conditions found existing in nature, and must be received with some reserve. Frankland's experiments show that the bacillus anthracis perished in a few days, but the spores retained their vitality for months.

The typhoid bacillus retains its vitality for ten days, even in distilled water.

The cholera bacillus multiplied enormously in sewage, while in filtered or deep well water little or no multiplication took place.

Tubercle bacilli, from other experiments, have been found living after six or seven weeks in running water.

The cholera bacillus requires some further notice from its important relationship to water as its vehicle. It has been found that in waters which are stagnant, and where there is a local accumulation of nutrient materials, or floating solid matters, multiplication of the bacilli occur. In a tank in India, polluted with fæcal matter, Koch found the bacilli present in enormous numbers, and cholera was prevalent at this place. We may accept, therefore, as an assured fact that in waters polluted with fæcal matter the bacilli of cholera and typhoid fever thrive; and, further, considering the fact that the dejecta in these diseases contain the actual contagion of these diseases, the connection between outbreaks of these and polluted waters, and the biological conditions of their casual microbes, agree in every particular. It must be borne in mind that water, however much polluted, which we may call x, will never develop cholera without the specific contagion y, but $x + y =$ cholera. Immunity, however, is derived from many causes, such as filtration of the water or sewage, with y, through soils (excessive pumping of wells diminishes the micro-organisms), and the growth of other organisms in the water with y lead to its destruction.

While microbes gain access to wells easily by surface contaminations, and by drains, gutters, etc., if they have to pass through a considerable length of soil the risk of their gaining entrance is very much lessened. Their progress is facilitated by porosity of the soil, and by the underground currents of subsoil water. Further points of importance in connection with bacteria in soil in relation to water supplies will be discussed under "Soils."

MICROBES IN SOILS.

Soils have been believed, since Pettenkoffer's deductions, to have an important influence in the production of infectious diseases. The connection, proved by statistics, of the relation between mortality of typhoid fever and variations of the level of the ground water, led Pettenkoffer to believe that the soil had a marked causal relationship to the production, not only of typhoid fever but cholera.

Pettenkoffer's "Law of the Subsoil Water," as it has been called, has been used differently from what he intended, and it is well to ascertain what he did actually mean; and in a paper in 1880, he says: "In my view the level of the subsoil water reveals nothing more than this—viz., the limits of a certain degree of humidity in a porous stratum of soil, or the limits within which the pores are kept constantly full of water, and all the air driven out of them. Between that degree of humidity and absolute dryness of the porous stratum, there are all of those gradations where the pores are filled in part with air and in part with water in varying proportions, which we include altogether under the terms 'moist' or 'wet.' The point at which the pores are completely closed by water is one that may be observed with ease and certainty; and I have therefore chosen the level of the subsoil water merely as an easily seen gauge and index of certain states of humidity in the stratum of porous and permeable soil which overlies the subsoil water; an index, namely, of the fluctuations of the humidity within a given period, and of the time when any one degree has lasted. Whether that index is a few feet nearer to, or farther from, the surface does not affect the value of its revelations. For the value of the index lies in this, that it declares the changes in the humidity of the overlying strata by means of the natural effect of these changes. The fluctuations in the level of the subsoil water have a meaning for etiology, only because they are traced back to those primary influences by which air and water are made to share, in varying proportion, the possession of the pores of an impregnated soil. Beyond that they have no significance."

We have referred fully to these well-known views, as they are of importance in relation to the subject of microbes in soils. Pettenkoffer further attributed the soil to have a definite and peculiar influence on infective germs, but modern research has not confirmed that view.

Soils have been arranged into three zones:

1. A superficial or evaporating zone. It is a receptacle for all pollution, microbes, ferments, etc.

2. Intermediate zone, constantly humid.

3. A compact zone. The subterranean water acts on this by capillary attraction.

The superficial zone is the one most likely to act as the breeding ground for organisms, whether harmless or pathogenic, as there the necessary food is met with for their growth. If we have fæcal matter, then, if the cholera or typhoid bacillus be introduced, under other favorable circumstances of temperature and moisture, it will grow and develop. These favorable conditions are very much what Pettenkoffer insisted on, only without giving to the soil any specific influence, which he believed necessary, there must be simply a porous, permeable soil, neither too wet nor too dry, sufficient pabulum, a suitable temperature, and the specific organism of an infectious disease introduced to give to the soil all the influence it can exert in the production of infectious diseases.

Murchison's views as to the origin of enteric fever are totally different from these, as he held that it might arise from decomposition of fæcal, and even of organic matter. And while he admitted that it was communicable, he believed that this was due to the decomposition of the excreta after their discharge. Modern research has shown that there is a specific microbe needed for the production of the disease, and without this neither water, nor soils polluted by organic or fæcal matters will communicate the disease to man. I might further extend this and say that none of the influences ordinarily held to be associated with typhoid, such as foul cesspools, untrapped drains, unventilated sewers, or all the array of conditions called insanitary, will produce typhoid, without the specific cause. These conditions undoubtedly have a marked predisposing effect, and this will be referred to further on.

If these conditions did of themselves generate typhoid, how is it to be explained that the disease is ever absent at all from every hamlet and village in Scotland, with their well-known insanitary conditions?

That micro-organisms exist in the soil can be proved by the very easiest methods for cultivation of organisms. Infusions

made from manured soils, even although diluted 100 times, still contain thousands in every drop; but the greatest interest is necessarily attached to the finding of disease-producing forms, and of these the bacillus of malignant œdema, and of infective tetanus are frequently found.

The formation of nitrates and carbonic acid by the action of microbes have also to be mentioned.

IMMUNITY FROM BACTERIA IN SOILS.

In the laboratory, by providing a specially prepared food suitable for the needs of each individual case, and by careful regulation of the temperature and moisture of the air, many disease-producing organisms can be cultivated; but when an individual organism, say, for example, the cholera bacillus, gains entrance to the soil, it by no means follows that it will meet with the necessary conditions of food, moisture and temperature. If the ground were polluted with fæcal matter, then this is a suitable medium, but the temperature must be between 60 deg. and 70 deg. F., or if the temperature be so high that drying of the bacillus takes place, this is fatal; if the soil is acid, this is fatal, nor can it grow in a water-logged soil. Another powerful antagonistic action is the growth of the various organisms of decomposition (Saprophytes). It is one of the many wise dispensations of providence that our enemies can only attack us after we have, with the most perverse ingenuity, broken all the laws which regulate health, and a visitation of cholera is a sanitary reformer needed now and again to put matters right.

Although microbes may not develop and multiply in the soil for want of the necessary favoring conditions, it must not be forgotten that they may be latent for long periods, especially in the spore forms. Thus the anthrax bacilli, which form spores, may remain latent for a very long period, probably years, and finally develop when the necessary conditions are provided. Admitting that disease-producing organisms are to be found in soils, the next question, and one of much importance, is:

[Concluded next week.]

CLEANLINESS AS A CIVILIZER.

It is true as it is trite, that man's progress in civilization can be marked by his progress in cleanliness, says the Indianapolis *News*. The ancient Jews so realized the force of this element as to rear it among the virtues next to godliness. But there is cleanliness and cleanliness, as there are degrees of dirt. Disassociated from personality, cleanliness shades lighter as one moves west in this country, or conversely, dirt appears darker, until one may almost gauge the degree of enlightenment in measuring by this standard.

The great difference between Western and Eastern cities, and between most large cities and small cities and towns, is the manifestation of cleanliness in public places. It is not a question of wealth, but enlightenment. The value placed upon architecture is a wrong one. It is not that the buildings of a city or the convenience of its public ways and means are greater or less, but that these are administered in a more or less effective way as to dirt and cleanliness.

A street improvement in a city in which it is an event counts only when new. Use quickly degrades it to the level of the old road that it replaced. Fine buildings, hotels, parks, everything to which the public has access, it will be found on examination, depend for their efficiency on the fidelity with which they are kept clean. In many a town there is a hotel or public building which, if not so munificent in its character, is in the luxury of its application the equal of that which is offered in larger cities. The intimate difference is in the daily administration which leaves dirt everywhere. The stairways, the halls, the fire places, even the floors are in evidence, continually, of the stolidity to the impression of dirt that holds a man closely to the soil whence he springs. The real reform is not in great buildings, but in the way in which those that exist are kept. In Indianapolis we have at least one public building and one hotel that are brilliant and beautiful object lessons in cleanliness, and their reputation has gone abroad.

It is said of us as a people that we are indifferent to dirt, the ground-work of the comments being the dirty streets that prevail in all American cities. The era of improvement that is beginning in this regard is marked. But the deeper improvement lies in the particulars alluded to, and which young cities especially, with all their striving after better conditions, do not as a rule apprehend. To make the comparison exact, it is not that a hotel in New York and a hotel in a small Western city, or a small interior town East, may differ in size and magnificence of appointment; it is that the New York hotel is kept clean. It is so in stores; the small establishments can not hope to rival the metropolitan in size and scope, therefore they appear as if they fell out of the race. The condition of the floors, of the walls, the littered appearance of counters and shelves give an air of shiftlessness that depreciates the real force and effect of the establishment at least 25 per cent. They do not give themselves a fair chance.

There is hardly a city of 100,000 people, or less, which, without one dollar of improvement, in buildings or streets, could not take a great step forward in civilization by expending a trifle in money cost for cleanliness. In great cities, indeed, the object lesson is apparent, for there establishments are frequently in close quarters instead of commodious ones.

Quality, quality, that is the key-note.

In our wholesale appreciation of the largeness of things we have too much forgotten this. We have depended upon size. The excellence of the monument has been prefigured by the statement of its height; the excellence of a public building by its cost or its superficial area; the recommendation of a hotel by the number of rooms it has; of a store, by the amount of square feet it covers. This is the lush and riotous growth of nature. Civilization steps in to wipe out and convert the evidence, and in a garden to be stepped across, presents an example more perfect of civilization's higher attainment than does a farm which the eye can not easily measure. The point of progress is appearing as it were at its turning point now, and in the great cities in the West there is evidence that is seen and not acted upon. It can not be too urgently made.

There is within the scope of every community the attainment of taste that lies simply in cleanliness, which will set its feet in the way of progress as no mere money expenditure can do. It is not that the growing cities lack means. It is that they fail to do with what they have. The broadest foundation lies, of course, in improved streets, but it is evident that with it there does not come the idea of cleanliness which, starting from the street, enters the stairways and the offices and the hallways open to the public, and there mirrors the divorce from dirt that awakens that spirit found in the apothegm "cleanliness is next to godliness."

HEALTH IN MICHIGAN, NOVEMBER, 1890.

For the month of November, 1890, compared with the preceding month, the reports indicate that cerebro-spinal meningitis, puerperal fever and inflammation of kidney increased, and that cholera infantum, dysentery, inflammation of brain, diarrhea, cholera morbus, typhoid fever, pleuritis, measles and whooping-cough decreased in prevalence.

Compared with the preceding month, the temperature was much lower; the absolute humidity and the relative humidity were less; the day ozone and the night ozone were considerably less.

Compared with the average for the month of November in the four years, 1886–1889, cholera morbus, influenza, inflammation of kidney and scarlet fever were more prevalent, and typho-malarial fever, whooping-cough, dysentery, measles, inflammation of brain, inflammation of bowels, cholera infantum and puerperal fever were less prevalent in November, 1890.

For the month of November, 1890, compared with the average of corresponding months in the four years, 1886–1889, the temperature was higher; the absolute humidity and the relative humidity were about the same; the day ozone and the night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of November, 1890, at sixty-five places; scarlet fever at sixty-eight places; typhoid fever in fifty places, and measles at twenty-three places.

Reports from all sources show diphtheria reported at ten places more; scarlet fever at eleven places less; typhoid fever at forty-six places less, and measles at five places more in the month of November, 1890, than in the preceding month.

HENRY B. BAKER, Secretary.

LANSING, Mich., Dec. 5, 1890.

VENTILATION OF DWELLINGS IN WINTER.

Dr. V. Budde, of Copenhagen, contributes to a recent issue of *Zeitschrift fur Hygiene* some interesting remarks relative to experiments on the most convenient method of removing air from living rooms during the winter months. He says:

In the ventilation of dwellings the aim is to disperse as much as possible the fresh air at the time of its admission, and conversely to draw the vitiated air as speedily and as directly as possible in order to prevent it from becoming mixed with the fresh air. In actual practice the solution of these problems depends upon a multiplicity of details which the author states that he has here undertaken to investigate. Whether the apartment is heated by close or open stoves, or by hot air from some central apparatus, the tendency of the warm air is to rise toward the ceiling, there to spread itself out. and from thence to descend in currents toward the lower portion of the room, where the outlets are usually placed. The heat radiated in a horizontal direction may be here left out of consideration, as being of minor importance. All the exertions of the human body and the products of combustion have a similar tendency to ascend, in spite of the density of the carbonic acid gas, and these impurities, mixed with the heated air, also rise to the upper part of the room. These facts would point to an exhaust placed at the highest part of the room as the more suitable arrangement, with an up-draft system of heating and ventilation instead ef the down-draft system now in vogue. Deny has recently formulated a series of objections to this plan, and has at the same time proposed a different arrangement. He states that when the heated and impure gases just beneath the ceiling comes in contact with the cold external walls, these gases contract in volume, increase in density, and stream downward close against the wall. In lieu of a few scattered openings for the extraction of this cooled and impure air, Deny proposes a perforated plinth or panelled opening all along the face of the cold walls near the floor level. This collecting channel should be led into a verticle flue, the air in which is made to move with a velocity of from 1.8 m. to 2 m. per second. The air in the collecting chamber should have a velocity of not more than 1 m. to 1.2 m. per second.

No information is given by Deny's treatise as to whether any practical tests have been made to verify the accuracy of his theories, and in particular whether the volume of carbonic acid present at different levels and in various parts of the room is in accordance with his assumption. As this question is one of undoubted public interest the author deemed it expedient to undertake a series of experiments under varying conditions. The results of his investigations, in which he was aided by Messrs. Jensen and Struer, are here recorded. The experimental room was 4.68 m. long, 2.59 m. wide, and 3.11 m. high; its area was therefore 12.1 sq. m. (130.24 square feet), and its contents 37.7 c. m. (1321.41 cubic feet). It was heated by means of an open stove in one corner; it had one window with a door opposite to it, and it was furnished with a long horizontal exhaust flue, and apertures for inlet and extraction of air capable of being opened or closed. The tests were conducted with 12 stearine candles and a lamp, and all the arrangements are described with reference to a plan and section of the room. The temperature observations were taken by five thermometers placed at various levels, being attached to a cord stretched from floor to ceiling in the middle of the apartment. Two anemometers, the formula for the use of which had been accurately computed, and a manometer of special construction were employed. The measure of the pollution of the air was based on carbonic acid gas determinations on the system of v. Pettenkoffer. The proportion of carbonic acid gas was estimated in eight different places, and the temperature was at the same time observed in the same places. The results of four sets of experiments A, B, C and D, are set forth in tabulated form.

The most important point observed was the great difference in volume between the fresh air admitted and the foul air exhausted in each of the four experiments, the latter being in all cases nearly three times the bulk of the former, the fresh air varying from 53 to 61 c. m. per hour, the foul air extracted varying from 142 to 169 c. m. hourly. The balance must, of course, be due to natural ventilation by crevices, percolation, etc. Five sets of observations on the contents in carbonic acid gas follow; these are also arranged in a series of tables, and show the proportions of carbonic acid gas, the volume of gas in the outlet flue being taken as unity. In two of the experiments in which the paneled collecting flue on Deny's principle was used, it was found that the air in the exhaust ventilator was richer in carbonic acid gas than was that in any other part of the room. This plan of exhaustion, however, is only really advantageous when a system of heating is employed which causes a powerful up-draft and a consequent horizontal movement of the stratum of hot air beneath the ceiling. Among the points insisted upon as the outcome of the experiments are the need of warming the fresh air before it is introduced into the apartment, and the fact that an exhaust flue at the upper part of the room, while it removes large volumes of heated air, does not extract an equivalent volume of polluted air. The evidence was all in favor of the longitudinal exhaust flue at the skirting, which extracts the largest volume of polluted air in the most economical way—that is, by insuring the fullest possible utilization of the artificial heat produced within the chamber.

REGISTRATION OF PLUMBERS.

Lord Aberdare, at a recent meeting held at the University College of South Wales and Monmouthshire, for the purpose of distributing certificates granted by the Plumbers' Company, London, to plumbers in the district under rules of the national registration system, said he felt that he, with every man who was capable, should do all he could to promote so salutary a movement as that which had brought them together. He was not going to say anything harsh about plumbers, but he had spent in his life, he grieved to say, some $100,000 in building, a great deal of which had been spent very unsatisfactorily. He had found everywhere a deep—he dared say in many respects a very unjust—mistrust of plumbers. His lordship then dealt with the movement from its origin, in 1884, and warmly commended the Worshipful Company of Plumbers for the action they had taken. It had very soon been found that there were in the trade a vast number of persons who were unworthy to be called plumbers. Through the extraordinary increase in population and in building, a vast number of men got employment as plumbers who did not know their work. The consequence of that had been—touse a schoolboy's phrase, but one perfectly applicable—"awful." The number of deaths which he supposed all of them could trace to bad plumbing was awful. That was going on still, and the work the Worshipful Company had undertaken to register competent men all over the country was not completed. Some 5,000 persons had been registered out of an estimated number of 35,000. And the examination was no child's play, for in some places as few as 15 per cent. had been able to pass, in others 70 per cent. had passed, the general average being 48 per cent. The Government had been asked to interfere in the matter. Considering the immense importance of the subject as affecting public health, it had been asked to have a system of registration such as had been allowed in the case of medical men. The health of the inhabitants of a house depended upon its sanitary condition. Mr. Ritchie, with a ministerial caution with which he was not unfamiliar, had spoken very kindly and encouragingly, but declined to commit himself. He recommended the plumbers not to be too sanguine in hoping that the Government would interfere to compel registration. But he was happy to see a number of public bodies and eminent persons had announced their determination that no one who had not received a certificate should be employed to do their work. Some county councils, at least one in Yorkshire, had laid that down, and he was delighted to hear that many hospitals and water-works companies had laid down the same rule. The Duke of Westminster, who had enormous estates, and who really spent his whole life and income, after deducting a very small portion for personal expenses, in works of public utility, had come to the same resolve. Registration afforded pretty good proof that a workman was a good workman, and could be trusted; but what they wanted was not to keep things at their present high level, but to get a higher. That level was to be got by the union of manual labor with scientific teaching. It had been considered that scientific subjects should be taught with special reference to trades, so that a man should be helped to do his work. He was quite sure a young man could not get at the higher parts of his work without adding dignity to it. This was what the Worshipful Company were about, and for this they deserved the utmost gratitude.

ELECTRICITY DIRECT FROM COAL.

Being asked recently by a reporter about future inventions in the electrical line, Mr. Edison replied: "Do you know, I have nothing to do with the future. My work, my thoughts are entirely engrossed with the present. It is from the present that I must work out, or study out rather, inventions that can be easily applied to commercial advantage. I deal exclusively with the practical things of life, and never try to dream useless dreams over an invention that will never benefit any one. I am now engaged on the vital question of electricity—viz: the way to obtain it direct, without the aid of other motive power. It has been a study of mine for years, and I confess that I have not succeeded in making the invention. I shall never cease trying to unravel the problem.

"The man who makes this invention will solve the question of motor power. I would gladly acknowledge the greatness of any one who could do this, and hail him as the king of inventors. No selfish motives of not being first would keep me from acknowledging his greatness. No other invention would so benefit and revolutionize the world. At present we have to use coal to generate steam, and it in turn gives motive power to the dynamo which produces electricity. Only about 15 or 19 per cent. of the energy of coal is thus used. The result is an expensive and vast waste. Tons of coal are used upon vessels on one trip to Europe, but if electricity can be generated directly from the coal, then only a few basketfuls will be necessary to carry the biggest vessel across the ocean.

"Have I succeeded in making any headway? Just a little. I can get some electricity direct from coal, but it has no force to speak of. It is not the true force I am looking for. I do not dream over it, but I confess I spend many hours working over it.

"Think of it: Electricity directly from coal. It may sound like an echo of the millennium, but I do not think so. We have succeeded in using electrical force in many and various ways; but electricity can never be the motor of the world if another power is necessary to generate it. The expense is too great, and so the original power is preferable, of course. Now, for a moment, imagine the condition of things following this invention: Steam will become a thing of the past, and the greatest and cheapest motor power, electricity, will be universally used. Some idea may be gained of the superior power of the new motors by stating that it will then only require three days to go to Europe, and only two or three days will be consumed in a railroad trip to California. The factory that I run, which now consumes a great quantity of coal daily, will need only a small basketful of coal to keep it going all day. Great factories that annually burn thousands of tons of coal will be run on several tons, say two or three or a few more, per annum, saving many thousands of dollars. The cost of living, the cost of goods, the cost of nearly everything will be reduced. It will cost nothing to make ice. It will be a revolution, not to throw any one out of employment, not to ruin any industry, but to benefit mankind and civilization in general."

VENTILATION BY HEAT.

The following was read by W. P. Buchan, Sanitary Engineer, before the Philosophical Society of Glasgow:

Some time ago I was testing the speed of air up the ventilating-pipe from the ceiling of a church. The vertical part of this pipe was about 40 ft. high, while the diameter of the pipe was 18 in. Near to the bottom of the vertical pipe there was a small circular gas-tube, with provision for lighting a dozen of gas-jets when wished. I first tested the ventilating-pipe without the gas being lighted, when the speed indicated was 160 linear feet per minute. With the gas lighted, the speed rose to 300 linear feet per minute. This was no great speed, but it showed that the heat of the gas gave considerable increase of up-current. Then the question occurred, Would the speed be still further increased by suspending a piece of 12-in. pipe, and, say, 3 ft. long, of thin sheet-iron a little above the gas-jets, so that when these jets are lighted they would heat the 12-in. tube, and so increase the up-current? As it was going to be rather troublesome to make the experiment with the 18-in. pipe, I constructed a 6-in. diameter pipe, 3 ft. long, with a 3-in. diameter inlet at its foot, but to one side, the bottom being closed with a lid. The 3-in. diameter inlet was to suit the anemometer.

Upon suspending a piece of 3-in. diameter thin sheet-iron tubing, 1 ft. long, above a No. 4 Bray's gas-burner, placed inside of the 6-in. pipe, the speed indicated, with the gas lighted, was 520 linear feet in two minutes. With the 3-in. tube removed, the speed rose to 585 ft. in the two minutes, showing a difference of 65 ft. The inner tube in this case, therefore, did more harm than good. Another experiment was thereafter made with a piece of plain sheet iron about 1 ft. long and 5½ in. wide, suspended a little above the gas, with the result that with this sheet-iron plate on the speed indicated was 555 ft. in two minutes. Upon removing the plate the speed rose to 580 ft. in two minutes. The use of the plates would, therefore, appear to be a mistake, and a pure waste of money also,—the up-current being fully 5 per cent. less with it than without it.

This loss of speed with the inner tube or the plate suspended avove the gas I attribute to the extra friction.

As Mr. Aitken, of Darroch, has stated that there are about 400,000,000 particles of matter in a cubic inch of air above a Bunsen gas-burner, we have still an ample quantity to heat the air in a ventilating tube, without the addition of either the inner tube or suspended plate above referred to, supposing the number of particles of matter above an ordinary gas-jet were less than a quarter of the number mentioned by Mr. Aitken.

In order to get the full value of the heat and conserve it for the up-current, it would be all right to wrap abestos or felt around the outside of the pipe, but suspending large concentric pipes or plate inside the outlet ventilating pipe in the manner described, appears to me to be a pure waste of money. They retard the up-current, and so harm the ventilation, whether the gas is lighted below them or not; and in many cases, in practice, the gas would not require to be lighted, as when there was wind or other natural cause to produce a good up-current. In this latter case suspension of a pipe or plate inside of the outlet pipe would simply be *a continuous check*. In fact, in thousands of cases, were the outlet ventilating pipes put in large enough, and fitted up properly, no gas would be needed—as, *e.g.*, for one-storied schools and for churches and many halls, &c.

CAUSTIC LIME FOR PURIFICATION OF SEWAGE WATER.

Dr. H. Weigmann, of Kiel, Germany, contributes to the *Gesundhists-Ingenieur* an interesting article on the above subject. In the pamphlet of foreign abstracts of the British Institution of Civil Engineers, the following resume of it is given:

While admitting that the purification of sewage water by means of irritation is the more perfect system of treatment, Dr. Weigmann points out that in certain cases some chemical process has, for various reasons, to be employed. Notwithstanding the numerous substances which have been proposed, lime still holds the foremost place. The caustic lime combining with the carbonic acid gas, a product of decomposition always present in sewage water, yields a bulky precipitate of calcic carbonate, which mechanically entangles the suspended impurities, and effects a rapid clarification.

Recent experiments respecting the action of lime have shown this substance to possess such excellent disinfecting properties that it seems that the lime treatment is among the best of the precipitation processes. As one result of the use of lime, it is pointed out that the substances in solution are thereby invariably increased rather than diminished in quantity, though the recent researches of Schreib tend to controvert this theory. In order to arrive at accurate conclusions, careful estimations of the amount of chlorine in the sample, both before and after treatmeut, are advisable. Dr. Weigmann's experiments have led to the conclusion that from the clarified effluent after the lime treatment there is a considerable evolution of ammonia and other nitrogenous gases, and he states that though water which has been rendered so strongly alkaline as to destroy all the bacteria therein cannot decompose so rapidly as water teeming with bacteria (which are the active exciters of putrefactive changes), there can be no doubt that, owing to the dissolved lime, an important change takes place in the condition of the organic substances in solution. Dr. Weigmann insists upon the necessity for a rapid separation of the sludge from the water in order to put an end to the changes which take place in the organic matters entangled with the calcic

carbonate, and points to the advantages, on chemical grounds, of passing the sludge through a filter press, as soon as possible after decomposition, as is done, for instance, in the works at Halle.

In addition to its powerful action in destroying the bacteria and germs of every kind, there can be no doubt that lime is a strong disinfectant. The tendency of alkaline sewage water, after it has, by means of carbonic acid gas in the atmosphere or in the river water, parted with its dissolved lime, is to become again rapidly charged with bacteria; but these are by the self-putrification powers of running waters speedily rendered innocuous or converted into the food stuff of water plants, and it is pointed out that the previous lime precipitation has removed all the germs of a pathogenic character, and the new growth of bacteria are probably of a non-dangerous character.—*Engineering and Building Record.*

REVIEWS AND NOTES.

A Treatise on Headache and Neuralgia. By J. Leonard Corning, M. A., M. D., (New York: E. B. Treat, 5 Cooper Union, cloth, $2.75).—The widespread miseries which the author of this treatise seeks to relieve will make for this volume an extensive demand. According to the title the work is divided in two general divisions as regards the subjects treated. The first is headache—pains which owe their origin to inter-cranial causes, and, second, neuralgia—pains which owe their origin to extra-cranial causes. Following these are parts devoted to consideration of methods of treatment, irritative conditions of the spine, normal and morbid sleep.

In this volume the author has undertaken the difficult task of explaining the nature and treatment of those pains about the head, which constitute such a fruitful source of misery. Dr. Corning is eminently qualified for the work, and has long been known to the profession as a brilliant and indefatigable laborer in the cause of practical neurology. His contributions to neurotherapeutics are among the most practical and suggestive additions which have been recorded during recent years. To rare powers of perception Dr. Corning unites, in an eminent degree, the faculty of imparting knowledge in an entertaining manner. His style is at once lucid and forcible, not the least of his charms being the power to awaken thought as well as to impart information. In all matters involving the treatment of pain Dr. Corning is an acknowledged authority, and the precepts which he inculcates are alike worthy of the physiologist and the accomplished physician. The present treatise on "Headache and Neuralgia" is replete with suggestion and useful matter, and no thoughtful physician can fail to derive both inspiration and practical assistance from its perusal. An appendix is added treating of "Eye Strain as a Cause of headache," by David Webster, M. D., whose reputation as an accomplished opthalmologist is a guarantee of his ability in this direction. The subject is discussed under the heads: "Errors of Refraction, Impaired Accommodation and Insufficiency of the Extrinsic Ocular Muscles," and is as interesting as it is instructive.

"All Around the Year—1891" is one of the most handsome calendars extant, and is published by Lee & Shepard, Boston, and S. A. Maxwell, Chicago. It is designed in Sepiatint and color by J. Pauline Sunter. Printed on heavy cardboard, gilt edges, with chain, tassels and rings. Size, 4¾x5½ inches. Boxed, price, 50 cents. The marvelous success which has attended the production of Messrs. Lee & Shepard's calendars in previous years has led them to bring out an entirely new one for 1891, which far surpasses any yet issued in the designs and quality of workmanship. In addition to the calendar for each month, each card contains a charming design and an appropiate sentiment in delicate tints and colors. The designs are mostly of chubby children in various scenes, drawn in the picturesque style of the artist, and, altogether, it is the handsomest and most delicate calendar yet offered. The cards are tastily tied with white silk cord, and a chain attached, by which they may be hung on the wall or elsewhere, and are so arranged on rings, that they may be turned over like the leaves of a book as each month shall be needed for reference.

The *Art Amateur* for December, 1800, is at once the beginning of a new volume and a Christmas number, increased in size both in the paper itself and its supplement without extra charge. The colored plates are exceptionally fine and include: "A Portrait Study" by J. Carroll Beckwith, being a fac-simile of the "first painting" in oils of the portrait of Mr. Colfin, the artist. This large supplement is probably the most important yet issued of the first stage of a portrait, showing also, as it does, the grouping and arrangement by which it makes a study into a picture. The large plate of roses in a metal vase, by Victor Dangon, is the favorite reference study in oils of this well-known master of flower painting, and as such he declined to part with the original so marvelously reproduced here. The third colored design is for the plates in rich "Royal Worcester" china decoration in gold and colors, by H. A. Crosly. A very important paper on Puvis de Chavamies, copiously illustrated, by Roger Riadon, commences this month. The series of "Our American Art Schools" is begun with a notice of the Academy of Fine Arts, Philadelphia, by Ernst Knaufft, who also contributes a chapter (xix) of his "Pen Drawing," for illustrators. The first with charming fac-similes of students' work at the school it describes. The number is so strong in every department that it is impossible to note half its contents. China painting, with designs by Patti Thum and M. L. Macomber; embroidery, with reproductions of beautiful Chinese borders and other designs; woodcarving, with a chain back in naturalistic style, by C. M. Jenckes; brass repousse work, with a two page design for paper and envelope box, by W. C. J. Gawthorp; monogram and name devices, specially designed for various subscribers—may be named as some of the attractions in what may be fairly claimed to be the strongest number yet issued of this magazine.

AMONG THE PLUMBERS.

J. Pickering Putnam, Boston, Mass., has been granted a patent for a water closet and supply tank.

James C. Barr's place of business on 22nd street was broken into last week, and a large quantity of plumbing material was stolen.

Frank Falk, a plumber at 771 Milwaukee avenue, was fined $100 and costs by Justice Wallace last week, for doing defective work and not reporting his work to the health department.

Andrew Young and wife left last Monday evening for an extended visit through the South. While absent Mr, Young will attend the convention of the American Public Health Association at Charleston, S. C., where he will represent the Health Department of Chicago in his usual able manner.

The plumbing class of '91 at the New York Trade Schools numbers 83 members who represent a score of states and territories. Illinois sends four pupils, the names being Harry F. Hubbard and Charles E. Page, of Urbana, Albert E. Goltra and Patrick F. Murphy, of Jacksonville. Only six members of this large class are sons of master plumbers.

The most handsome calendar for 1891 that has been thus far received is issued by the Instantaneous Water Heating Company, of 210 Illinois street, Chicago. The calendar is most artistic, cleverly designed and really pretty. If this piece of work is an index to the character of the company's manufactures, they will find nothing but universal praise and extensive sales.

Robert Griffith, president of the National Association of Master Plumbers, has issued an official notice announcing a meeting of the Executive Committee of the National Association some time in January, 1891. He requests that important matters be sent to headquarters as soon as possible in order that they may be brought before the committee when it meets.

An unpretentious exchange makes the following comment on the worthy plumber;

"You can't cure hams with a hammer,
Nor measure a dram with a drama;
Stew plums with a plumber,
Do sums with a summer,
Nor yet shear a ram with a rammer."

The St. Louis *Republic* speaks thus of Chicago's insanitary conditions: "One of the Chicago papers expresses concern because it is still uncertain whether or not there will be a "health exhibit" at the World's Fair. This is really something worth worrying about. If there is anything Chicago needs it is a health exhibit, but her exhibit of insanitary conditions cannot be matched on the face of the earth, and it will just about be at its ripest stage at fair time."

Nicol & Strong, of Kansas City, have brought suit against the Kansas City Master Plumbers' Association for $50,000 on the ground that the association has destroyed their business. The alleged injury arises from the fact that Mr. Strong was refused a membership in the association, and Mr. Nicol was suspended until he severed his business connection with Strong. This Mr. Nicol refused to do, and it is alleged that the association used an agreement it has with plumbing supply houses to injure the firm.

Pittsburg plumbers: Houston & McShane will do some fine plumbing work for the city in the new fire engine house on the corner of Shiloh and Virginia streets and for the Duquesne Traction Company in a building on Craig street. F. C. Kohne & Co. will fit up a building on the corner of Wood street and Sixth avenue. A. W. McGahan will do the work in two houses on Dithridge street, in one on Boquet and Frazier streets and in one at 626 Smithfield street. Buerkle & King have a contract for the plumbing work in a house on Penn avenue and 37th street. White & Mattel will plumb a building on Forbes street. McGinniss, Herlehy & Co. will fit up eight houses on Gilmore street.

The master plumbers of Toronto, Ont., have adopted the following resolutions: That the working hours during the months of December, January, February and March be from 8 A. M. to 5 P. M. for week days except Saturday. That we have the Saturday half holiday all the year round, and any work done on Saturday afternoon be paid for at the rate of time and one quarter hour. That as this association has rules and regulations in force at present with regard to our apprentices which we have found to work satisfactorily we would deem it unwise to interfere with the same at present. That the present state of trade does not warrant us to make 30 cents per hour the minimum rate of wages for plumbers; and further, that we find it hard enough at present to collect our accounts made up at the present rate of wages.

If any of our readers have copies of the SANITARY NEWS No. 202, December 17th, 1887; No. 250, November 17th, 1888, or title page and index for Volume XI, November, 1887 to April 1888, which they do not need, we will be obliged if they will communicate with us, as we wish to obtain them to complete the files of an old subscriber for binding.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Atlanta, Ga.: Burnham & Root, Chicago, are preparing plans for the Equitable Life Insurance building——Fort Worth, Tex.: A new hotel will be erected. Burnham & Root, Chicago, architects.——Evanston, Ill.: R. S. Pentecost, Chicago, has plans for the new Grand Sheridan hotel to be erected in South Evanston. ——St. Paul, Minn.: Sixth street, near Robert street, a three-story brick store; cost, $40,000.——Salem, Va.: The Board of Trustees of the Baptist Orphanage have decided to build an orphan asylum. —— Salt Lake City.: West Temple street, a four story stone building; cost, $50,000. H. Monheim, architect.——Columbus, O.: Long street, a brick apartment house; cost, $20,000. Address Wm. Monypeny.——Chicago, Ill.: J. A. Wiersbienric is working on plans for a three-story store and flat building to be erected on Grand boulevard; cost, $20,000. 332-334 North Franklin street, a four-story flat building; cost, $22,000. Address J. H. Moore. Ellis avenue. near Forty-seventh street, two three-story dwellings; cost, $34,000. O. W. Marble, architect. Forty-seventh street, near Halstead, a store and flat building; cost, $15,000. George Beaumont, architect. Three four-story residences to be erected on Grand boulevard, near Forty-first street; cost, $30,000. W. Thomas, architect. Corner Michigan avenue and Thirty-fifth street, a new hotel building; cost, $300,000. Clifford Warren, architect. Corner Cottage Grove avenue and Fortieth street, a large apartment building; cost, $225,000. Robert Ray, architect. Western avenue and Parnell Park, two apartment houses; cost, $60,000. S. M. Randolph, architect. ——Detroit, Mich.: Southeast corner Fort street and Campan avenue, a five-story brick factory; cost, $50,000. John Scott & Co. architects.——Fort Worth, Texas: Mayor J. P. Smith has recommended to the City Council the erection of a city hall, to cost $125,000.——Grand Rapids, Mich.: A three-story brick and stone hall; cost, $50,000. S. J. Osgood, architect.——Greenfield, Mass.: Miles street, a three-story brick block for stores and hotel; Henry W. Warner, owner.——Greenville, Miss.: It is proposed to erect a $60,000 court house.——Kansas City, Mo.: The congregation of the First Presbyterian Church will erect a brick edifice, to cost $35,000. The plans have been drawn by W. F. Wood, of this city.——Ludlow, Ky.: A church is to be erected by the local Baptist Society.——New York City: Corner of Seventieth street and Avenue A, two fine brick stores and flats; cost, $37,000. B. W. Berger, architect. Eighty-second street, near Amsterdam avenue, three three-story brick dwellings; cost, $45,000. G. A. Schellenger, architect. 212 Eighty-fifth street, a five-story brick flat; cost, $22,000. Jno. C. Burne, architect. 12 Waverly place, a six-story brick store; cost, $45,000. A. Zucker, architect. Ninetieth street, near Tenth avenue, five three-story brick dwellings; cost, $75,000. The Department of Public Works will shortly advertise for bids for the Harlem Court House. Thom & Wilson have prepared the plans. Alfred Zucker has designed an eight-story brick, iron and terra cotta warehouse, to be built at 36-38 East 12th street; also a six-story and basement brick, stone and terra cotta warehouse, to be built at 12 Waverly place, at a cost of $45,000. Edward Wenz has designed three five-story brick, stone trimmed flats, to be erected on the south side of 85th street, 180 feet east of 3d avenue, to cost $66,000. J. W. Cole has designed five five-story brown-stone front flats, to be built on the south side of 102d street, 300 feet west of 9th avenue, to cost $100,000. Rotch & Tilden, of Boston, are the architects of the brick and stone residence, to be built at 3 East 56th street. 309-311 Twenty-second street east, a six-story brick factory; cost, $32,000. French, Dixon & DeShaldren, architects. 207-211, 119th street east, a five-story brick storage building; cost $25,000. W. H. C. Hornum, architect. 66 Pitt street, a five-story brick flat; cost, $20,000. Chas. Rentz, architect. 101st street, near Manhattan avenue, a five-story brick flat; cost, $20,000. R. R. Davis, architect.——Minneapolis, Minn.: 207-9 Grant street, a brick apartment row; cost, 20,000. A. W. Spaulding, architect. First street, near Sixth avenue; alteration in flour mill; cost, $40,000. 315-17 Oak Grove, a frame dwelling; cost, $16,000. Orff Bros., architects.——Owosso, Mich.: A three-story brick and frame manufacturing building: cost, $50,000. Edward C. Van Leyen and Jean A. Hackett, Detroit, Mich., architects.——Denver, Colo.: First avenue, near Broadway, a brick building; cost, $20,500. A. Fairie, architect.——Brooklyn, N. Y.: Eleventh street, near Eighth avenue, five three-story brick dwellings; cost $25,000. A. V. B. Norris, architect. Corner Fourth street and Myrtle avenue, a six-story brick factory; cost, $30,000. Wm. H. Beers, architect. Corner Fourth avenue and Third street, a four-story brick store and flat building; cost, $35,000. W. M. Coots, architect. Corner Bushwick avenue and Jefferson street, a one-story brick church; cost, $56,000. Th. Englehardt, architect.——Allentown, Pa.: Corner Second and Chestnut streets, a two-story brick school building; cost, $12,400. L. S. Jacoby, architect. Braddock, Pa.: A $25,000 school is to be erected here. Address the Township School Board.——Buffalo, N. Y.: Niagara and Pennsylvania streets, a four-story brick and stone building; cost, $30,000. August Esenwein, architect.——Dallas, Texas: Plans are afloat for a sanitarium to cost about $150,000; also for a seven-story building for T. Scollard, to cost $100,000.——Coon Rapids, Iowa: Steps are being taken to erect a packing house.——Montreal, Canada: The Clendinning Company has been incorporated here, with a capital stock of $500,000, for the purpose of operating rolling mills, and the manufacture of iron and the manufacture of iron bridges, water-works, hydraulic works, railway equipments, etc. ——South Superior: A valuable iron manufacturing plant is to be established. Mr. McIntyre, of the Improvement Company, is in possession of particulars regarding the project.——Yankton, S. D.: The Yankton Portland Cement Company has been incorporated, with a capital of $500,000. It is proposed to erect a building for the manufacture of Portland cement, and it is probable that estimates on the edifice and the necessary machinery will soon be wanted. S. W. Swift is President of the Company.——Riverton, Ala.: The Riverton Land Co. will erect three dwellings from plans prepared by W. A. Crossland & Son, of Florence, Ala.——San Antonio, Tex.: 25-29 Commerce street, a two-story brick building; cost, $30,000. Alfred Giles & Grindom, architects.——Pekin, Ill.: Extensive shops are to be

erected by the Atchison and Santa Fe Railroad Company.——St. Louis, Mo.: The plans and site for the new Union Depot in St. Louis have been selected. The depot will be erected at Twentieth and Market streets, and will cost $2,000,000.——Avondale, Ala.: A bill has been introduced in the legislature of Alabama authorizing Avondale to issue $15,000 of bonds for building a school-house.——Washington, D. C.: Leon E. Dessez is preparing plans for the erection of the power house of the Rock Creek Railway Company of Washington, D. C., to be built in Montgomery county, Md.; it will be 130x110 feet and will cost $75,000.——Cincinnati, O.: Corner Fifth and Race streets, an eight-story business block; cost, $150,000. M. Rumbaugh, architect. Gustave W. Drach is preparing plans for five brick dwellings to be erected on Terrace avenue; cost, $35,000.——St. Paul, Minn.: A three-story brick store and office building to be erected on Sixth street, near Minnesota street; cost, $40,000. Address Ansel Oppenhiem.——Hartford, Conn.: Trinity parish have voted to erect a new and larger church edifice and appointed a building committee consisting of Rev. Mr. Seymour, J. L. Green, Dr. G. P. Davis, C. H. Lawrence, L. W. Clark and Rev. Francis Goodwin. A communication was received and accepted from Rev. Francis Goodwin proposing the erection by him of a memorial parish building to be connected with the new church. B. M. Lincoln is the architect for the rebuilding and large additions to the Parks & Savage bakery on Albany avenue; the cost of the work will be about $25,000.——New Haven, Conn.: The plans of the new church for the Summerfield M. E. Society are nearly completed; cost about $16,000. Denver, Colo.: Tallmadge & Boyer will erect a $40,000 brick flat building.——Holyoke, Mass.: Corner Park and Hampshire streets, twelve brick blocks; cost, $20,000. Theopile St. Martin, owner.——Huntington, W. Va.: The J. P. Legg Architectural Co., St. Louis, Mo., have prepared plans for a hall and stores for Geo. A. Flooding; cost, $20,000.—— Charleston, S. C.: The Kanawha City Co. will erect a fine hotel. B. D. Avis, General Manager, or T. O. M. Davis, Secretary, can be addressed for information.——Lincoln, Neb.: F. C. Fiske has plans for a bank and office building to cost $40,000.——Omaha, Neb.: Thirty-second near Dodge street, a private residence; cost, $40,000.——Detroit, Mich,: Grand River avenue, brewery, alterations and machinery; cost, $50,000. Hess & Raseman, architects.

HEATING AND LIGHTING.

Raleigh, N. C.: The Raleigh Street Railway Company is to erect an electric light plant.——Reidsville, N. C.: The city has purchased the electric light plant of the Reidsville Electric Light and Power Company.——Covington, Ky.: A. J. English and Powell Crosley, of Covington, have incorporated the Keystone Light and Heat Company. The capital stock is to be $1,000,000.——Charlottesville, Va.: The Charlottesville and University Electric Light and Gas Company is putting in an arc electric light plant.——Richmond, Va.: Levy & Davis want estimates on electric light plant for from 30 to 50 arc and a few incandescent lights.——Bessemer, Ala.: C. M. Avent will probably build gas-works at Bessemer.——Uniontown, Ala.: The city of Uniontown will construct the water-works system, and contemplates the erection of an electric light plant. J. C. Welch, Mayor, can give information.——Atlanta, Ga.: A bill has been introduced in the Georgia Legislature to incorporate the Fuel and Gas Lighting Company of Atlanta. ——Chicago, Ill.: The National Hot-Water Heater Company has been formed at Chicago, to manufacture all kinds of heating apparatus; capital stock, $100,000. Incorporators, Hamilton Borden, Henry S. Down and Josiah Cratty.——Bement, Ill.: An electric light plant will be erected. Address the Mayor.——Indiana, Pa.: Information regarding the projected electric light plant at this place can be obtained by addressing Edward Rowe.——Corsicana, Tex.: An electric light plant will be established at an early day. ——Birmingham, Ala.: The Union Electric Company has been incorporated, with a capital stock of $50,000.——Syracuse, N. Y.: Improvements will soon be made to the local electric light plant. Alderman Small can give details.——East Aurora, N. Y.: The East Aurora Electric Light Company is about to establish a plant. The estimated expenditure is $12,000. Henry H. Persons is one of the incorporators.——Geneva, N. Y.: Reports say that another electric light plant is to be established at this place by local capitalists.——Gainesville, Fla.: There is a prospect of electric lights being introduced here soon.——New Castle, Pa.: The committee of the common council, appointed to ascertain what improvements should be made to the local lighting system, reports that 39 additional lights are necessary, and recommends that the lights be 2,000-candle-power arc lights, and that the city advertise as early as possible for bids to furnish seventy-five 2,000-candle-power arc lights. For particulars address Sobieski Lusk.——Chicago, Ill.: The Bear Magnetic Electric Company has been incorporated, to manufacture and sell the Bear magnetic electric apparatus, etc.; capital stock, $300,000. Incorporators, Simson J. M. Bear, Wm. A. Northway and Franklin Babcock.——Wheaton, Ill.: The Wheaton Electric Light and Water Company has been incorporated, to furnish electric light, power and water. Incorporators, Homer H. Fuller, Jordan J. Cole and C. W. Kimball. Capital stock, $20,000.

SEWERAGE NOTES.

Roanoke, Va.: An ordinance has been passed appropriating $50,000 for sewerage purposes. Plans for a sewerage system will be prepared by Mr. Rudolph Hering.——Wilmington, N. C.: Plans for a sewerage system will be prepared by Mr. Rudolph Hering.——Logansport, Ind.: Mr. Osmer, City Engineer, can give information concerning a complete system of sewerage. Investigations were made by Mr. Hering some months ago, and his report is now awaited. The preliminary surveys were made by Mr. Osmer.——Kansas City, Mo.: Mr. Butts, the City Engineer, has submitted to the Board of Public Works a scheme for dividing the city into six large sewer districts and providing for the construction of sewers, so as to eventually form a complete system.——Llano, Tex.: Plans for a sewerage system have been prepared by M. L. Lynch, of Fort Worth.——Houlton, Me.: The Houlton Sewerage Co. proposes to extend its line of pipe about 2,600 feet next year.——Holyoke, Mass.: The cause of the caving in of a part of the Front street sewer is said to be that a proper foundation was not secured across marshy ground, and the cost of repairs is estimated at $15,000.——Rochester, N. Y.: The special committee on the east side trunk sewer has engaged Mr. S. L. Gray, of Providence, R. I., to report on the proposed improvement.——Clarksville, Tenn.: The city will ask for authority to issue $100,000 bonds for sewers.——San Luis Obispo, Cal.: The city will vote upon the question of spending $45,000 for bridge, street and sewer works.——Jackson, Tenn.: The city council has ordered the purchase of additional flush-tanks for the sewerage system.——Jamestown, N. Y.: The common council has passed a resolution authorizing the Board of Public Works to construct the sewerage system recommended. ——Peoria, Ill.: The city council has passed an ordinance providing for the construction of sewers in District No. 8.——Knoxville, Tenn.: The city will petition the Legislature for authority to vote on the issuance of bonds for the construction of a sewerage system.——Nantucket, Mass.: It is estimated that a system of sewerage could be built for $24,000.——Beverly, Mass.: The sewerage question is receiving much attention. It is expected that a complete system will be planned and an adequate appropriation made.——Cicero, Ill.: It is probable that the city will be provided with a complete drainage and sewerage system.——Newton, Mass.: The Joint Special Committee on Sewerage has recommended that the plan of the city engineer be adopted. The system will cost $1,755,000. Charles F. Ross, Superintendent of Streets, can furnish particulars.——Newark, O.: Numerous sewer extensions are to be made. President Buchler, of the city council, can furnish particulars.——Brooklyn, N. Y.: The citizens of the Twenty-sixth Ward are making efforts to procure proper sewerage. H. Roth is at the head of the movement.——Albany, N. Y.: The Board of Aldermen is considering the extension of the Beaver Creek sewer, the cost of which is estimated at $125,000. For particulars address Alderman Cummings.——Syracuse, N. Y.: Steps are being taken looking to the construction of a system of sewers in the West End. Commissioner Horton, of the Board of Health, can furnish information.——Toronto, Can.: The city engineer is preparing plans for numerous additional sewers.

WATER-WORKS NOTES.

New Castle, Pa.: The citizens of this city will soon vote on the question of expending $100,000 on water-works. Mr. Fallis can furnish particulars.——Milledgeville, Ga.: Mayor Cline can

furnish particulars concerning the new water-works system.——Oklahoma, I. T.: It has been decided to construct a system of water-works.——Marion, Dak.: The officials of this place are discussing the question of making tests, with a view of establishing a system of water-works.——Philadelphia, Pa.: Director Wagner has suggested to the council's committee on water that an ordinance be passed requiring all manufacturers to use water meters in their establishments.——Dublin, Ga.: Mayor L. S. Stubbs can furnish information concerning the new water-works. ——Horton, Kan.: Mr. McCormack, of Chicago, was in the city last week engaged in working up an interest in a system of water-works.——Toronto, Ont.: A new water supply scheme proposes bringing water to the city by gravitation from Lake Simcoe through a tunnel fifteen miles long. The cost is estimated as not exceeding five million dollars for a daily supply of sixty million gallons.——San Bernardino, Cal.: A company is being formed to build an immense reservoir in Devil canyon for the purpose of putting water upon the great Muscupiabe ranch, which lies north of San Bernardino. The gentlemen composing the company are said to possess unlimited capital, and will open up and develop a large tract of land now in waste.——Lincoln, Neb.: Articles of incorporation have been published of the Tarryall Irrigating, Canal and Water Supply Company, of Western Nebraska. The amount of capital stock is $200,000. The canal will tap the North Platte river near the Wyoming state line and run through Scotts Bluff and Cheyenne counties. Its width will be 150 feet and depth six feet.——Springvale, Me.: The Springvale Aqueduct Company will the next season extend its main pipe to Littlefield's pond. It will also put in a filter plant, will complete the system of street mains on Water, Bridge, Main, Maple, Pine and Pleasant streets, and set a number of hydrants for fire purposes. ——Rockville, Conn,: The city voted at the annual meeting, December 6th, to instruct the city council to petition the legislalature for the right to bond the city for $150,000 to be used for the purpose of obtaining control of the water department.——Concord, N. H.: Foss & Merrill, city engineers of Concord, have recently completed a survey for the proposed system of waterworks between Great pond, Boscawen, and that city.——Salt Lake City, Utah: Residents on the "North Bench," Salt Lake City, have petitioned the city council to have the water mains extended to their property.——Liberty, Neb.: Bonds have been voted to the amount of $1,500 for the purpose of constructing a system of water-works in this village. There will be about 80 rods of main to be laid. Water will be furnished by windmill works with tank of perhaps 1,000 barrels. Address, for information, W. E. Wood, Village Clerk.——Perth Amboy, N. J.: A system of water-works will be established at this place at once.——Crawford, N. J.: A system of water-works will be established in the spring. For particulars address N. R. Foster.——Uniontown, Ala.: The officials of this city will petition the legislature for authority to issue $25,000 of bonds for constructing a system of water-works.——New Canaan, Conn.: The project of furnishing a water service for this place is under consideration.——Kittanning, Pa.: The water company at Kittanning contemplates putting in 2,000,000 gallon pumping engines in the spring, to take the place of 700,000 gallons now used.——McGregor, Tex.: The McGregor Artesian Water Company has been organized, with the following officers: Dr. W. R. Blailock, president; Charles F. Smith, secretary. The capital stock is $25,000.——Menominee, Mich.: The city will spend $90,000 upon improvements to its water-works system.——Cresco, Ia.: The town has voted in favor of constructing water-works at a cost of about $12,000.——Bloom, Ill.: A manufacturing town will be established at Bloom, a Chicago suburban village. Surveys are being made for proposed water-works.——San Jacinto, Cal.: The San Jacinto Valley Water Company has filed articles of incorporation with the county clerk. The capital stock is $250,000, and has all been subscribed. The directors are A. H. Johnson, G. D. Compton, J. A. Green, P. L. Griffin, W. W. Henry.——New Haven, Conn.: The capital of the New Haven Tramway Construction Company, newly organized, is $20,000. The company is incorporated for the purpose of constructing railroads, water-works, gas-works, pipe lines, electric light plants, street railroads and electric railroads.——Orange City, Ia.: The by-law to issue bonds for water construction has been carried by a large majority.——Oakland, Neb.: Oakland has voted to spend $4,500 on water-works construction.——Pittsburg, Pa.: The citizens are requested at the next general municipal election on the third Tuesday in February, 1891, to vote on the question of the extension of the water-works to Nine-Mile island in the Allegheny river.——Hammond, Ind.: At a recent meeting of the city council, Mayor Hammond was authorized to employ an engineer to estimate the cost of obtaining a supply of water from Lake Michigan, and make surveys of the route.——Ivanhoe, Va.: The Ivanhoe Land and Improvement Company is negotaiting for pipe works.——Barning Springs, Va.: A stock company has been organized to construct the pipe line in Parkersburg.——Pineville, Ky.: A northern company contemplates locating pipe works at Pineville.——Portland, Me.: The sum of $2,000 has been appropriated for additional hydrants.——Jenkintown, Pa.: The question of extending the water-works was voted on December 12th. ——Wall Lake, Iowa: A $2,000 system of water-works is contemtemplated.——Sheldon, Iowa: None of the offers made the city for water-works have been accepted. The matter is still open and any propositions will be duly considered.——Hanover, Mass.: The Abington and Rockland Water Company will furnish Hanover and part of Norwell with water.——Madison, Dak.: A new artesian well is being discussed.——Gainesville, Fla.: The city is agitating the question of a new water-works.——Amherstburg, Ont.: The clty has voted for a $28.000 water-works.——Grand Rapids, Mich.: The officials of this city are considering the matter of issuing bonds in the sum of $75,000 for making projected water-works extensions. President Davis, of the Board of Public Works, can furnish particulars.——Sioux City, Iowa: Messrs. Wagner and Monjeau, of the National Water Supply Company, of Cincinnati, Ohio, have asked that their method of water supply be investigated by the city officials. Particulars can be obtained by addressing Superintendent Sullivan, of the water-works department.——Dallas, Tex.: Eugene and Edgar Sweeney and Thomas Trotman have incorporated the Fairland Water-Works and Park Company with a capital stock of $25,000. ——Eagle Pass, Tex.: A 2,000,000 gallon reservoir is to be constructed. F. H. Hartz can give information.——Morrisville, N. C.: W. F. Clark will want a mining pump,——Fort Valley, Ga.: A bill has been introduced in the Georgia legislature to authorize the city to issue bonds for the construction of water-works.—— London, Eng.: Notice has been given on behalf of a committee representing the majority of the vestries and district boards of London, of a bill to be introduced into Parliament next session dealing with the water supply.——Uniontown, Ala.: J. C. Welch will want pumps for water-works.

BIDS AND CONTRACTS.

Indianapolis, Ind.: Bids for street-lighting are open until Jan. 5th, 1891. Address A. P. Shawver for particulars.——Plattsmouth, Neb.: Bids for building a court-house are open until Dec. 27th. Address Bud Critchfield, County Clerk.——Denver, Colorado: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 6th day of January, 1891, for all the labor and material required for fixing in place complete all the iron furring, lathing and plastering, ceiling light, etc., required for the U. S. court-house, post-office, etc., building at Denver, Colorado, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Denver, Colorado. Jas. H. Windrim, Supervising Architect.——Bombay, India: Proposals are wanted until February 16th for an experimental street-lighting plant. Address E. W. & R. Oliver, Corbet Court, London, England.——West Point, N. Y.: Sealed proposals, in triplicate, subject to the usual conditions, will be received until 12 o'clock noon on the 3d day of January 1891, for the erection of a brick Cavalry Barrack as per plans and specifications, to be seen at this office. Inclose proposals in envelope marked "Proposals for Erection of Barrack," and addressed to the undersigned, W. H. Miller, Captain and A. Q. M. U. S. A.—— Louisville, Kentucky: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 5th day of January, 1891, for all the labor and materials required for the approaches to the U. S. Court House, Post Office, etc., building, at Louisville, Ky., in accordance with

the drawing and specification, copies of which may be had on application at this office, or the office of the Superintendent. Jas. H. Windrim, Supervising Architect.——Annapolis, Md.: Sealed proposals, indorsed "Proposals for Lumber, etc., for the Naval Academy, Annapolis, Md., to be Opened Dec. 30, 1890." will be received at the Bureau of Provisions and Clothing, Navy Department, Washington, D. C., until 12 o'clock noon, Dec. 30, 1890, and publicly opened immediately thereafter, to furnish at the Naval Academy, Annapolis, Md., a quantity of lumber, roofing-tin, and three double cone reflectors, etc. Edwin Stewart, Paymaster General, U. S. Navy.——New York City: Proposals are wanted until Dec. 31, for lighting by electricity certain streets of this city. Address the Gas Commission, Department of Public Works.——Ballanger, Tex.: Proposals are wanted until Jan. 1, 1891, for the construction of a system of water-works. Address Mayor B. S. Taylor.——Washington, D. C.: Sealed proposals, indorsed "Proposals for Officers' Quarters at Washington," will be received until 12 o'clock noon, on Tuesday, Jan. 6, 1891, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be forwarded upon application to this bureau or to the commandant of the navy yard, Washington, D. C. N. H. Farquhar, Chief of Bureau.——Williamsport, Pa.: Sealed proposals will be received at this department until 2 o'clock P. M., Tuesday, Dec. 30, 1890, for manufacturing and placing in position in complete working order in the U. S. buildings at Williamsport, Pa., and Wilmington, N. C., certain articles of standard and special furniture. Specifications, drawings and blank forms of proposals will be forwarded to manufacturers and dealers upon application to the department. W. Windom, Secretary.——Lowell, Mass.: Proposals, indorsed "Proposals for Pumping Engine," will be received at the office of the Lowell water-works, City Hall, until Jan. 16, for the construction, delivery and erection of a 10,000,000 gallon steam pumping engine for the city of Lowell. Other information may be obtained upon application to Lowell Water Works Office, or from George H. Barrus, M. E., 95 Milk St., Boston, Mass.——Selmer, Tenn.: Proposals for building a court house at Selmer, the new county seat of McNairy county, Tenn., will be received by the McNairy County Real Estate and Improvement Company until Jan. 1.——Minneapolis, Minn.: Sealed proposals will be received at the office of the Board of Court House and City Hall Commissioners, No. 542 Boston Block, Minneapolis, Minn., until 10 o'clock A. M., on the 6th day of January, 1891, for granite cut stone, brick and iron work, for the first and second stories of the new court house and city hall building. Plans, specifications and letters of instruction can be seen at the office of Long & Kees, architects, No. 603 Kasota building, Minneapolis, Minn.——Winston, N. C.: Sealed proposals will be received by the Mayor and Board of Aldermen of the city of Winston at the Mayor's office of said city, until 2 o'clock P. M. of Friday, January 2, 1891, for constructing a part of the proposed system of pipe sewers for said city. Copies of general plans and specifications, forms of proposals and instructions to contractors, and any information relative thereto may be obtained from the Chairman or Engineer of the Sewerage Committee. J. W. Allspaugh, Chairman, Sewerage Committee.——Cincinnati, O.: Sealed proposals will be received at the office of the Board of City Affairs, until 12 o'clock noon of December 26, A. D. 1890, for four vertical pumps of 5,000,000 capacity each in 24 hours. ——Pittsburg, Pa.: Sealed proposals will be received at the office of the City Controller until 2 o'clock P. M., on Friday, December 26th, 1890, for the erection of a garbage furnace, on lot owned by the city of Pittsburg, on River street, 19th ward. Specifications and all information can be obtained from Charles Bickel, architect, Hamilton building, 91 and 93 Fifth avenue. J. O. Brown, Chief, Department of Public Safety.——Scranton, Pa.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 7th day of January, 1891, for the iron beams, etc., for the first floor, basement columns, etc., for the United States post office, etc., building, at Scranton. Pa. James H. Windrim, Supervising Architect.

Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

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Having read Mr. Morehead's experience plating with gold, silver and nickel, I sent for a plater, and have more work than I can do. It is surprising the spoons, castors and jewelry that people want plated. The first week I cleared $37.10, and in three weeks $119.85, and my wife has made about as I have. By addressing W. H. Griffith & Co., Zanesville, Ohio, you can get circulars. A Plater only costs $3. You can learn to use it in an hour. Can plate large or small articles, and can make money anywhere.

A. J. Jonson.

HOLIDAY RATES.

WABASH AND NIAGARA FALLS SHORT LINE.

For the Holidays the Wabash Railroad will sell tickets to all local stations on the system, and to Niagara Falls, Buffalo and Canadian points, at a fare and one-third for the round trip, on December 24, 25, 29 and January 1. The returning limit on tickets to Detroit and all other local stations will be January 5; from Buffalo, Niagara Falls and Canadian points, the returning limit will be January 3.

HOLIDAY EXCURSION RATES.

The Chicago & Grand Trunk Railway, Cincinnati, Saginaw & Mackinaw R. R., and the Michigan Air Line and Detroit Division G. T. Ry. have arranged to sell special holiday excursion tickets at one and one-third fare between stations on their lines and also to points on Detroit, Grand Haven & Milwaukee Ry., and Toledo, Saginaw & Muskegon Ry., under the following arrangement:

Christmas tickets will be on sale from December 24th to December 25th, inclusive, and good to return up to and including Jan. 3rd, 1891.

New Year's tickets will be on sale from December 31st, 1890, to Jan. 1st, 1891, inclusive, and good to return up to and including Jan. 3rd, 1891.

Special return tickets to all Canadian points west of and including Toronto, Niagara Falls and Buffalo, will be sold on the above dates and limits at one and one-third fare from all stations on the above lines.

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"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

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The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Milwaukee, St. Paul and Minneapolis.

The Chicago, Milwaukee & St. Paul Railway is the only line running solid Vestibuled, Electric Lighted, and Steam Heated trains between Chicago, Council Bluffs, and Omaha.

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For tickets, sleeping car reservations, and all information, apply at the Company's ticket office, 207-209 Clark street, or at its Passenger Station, Madison, Canal and Adams streets.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

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A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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WHEN man contaminates his abode and surroundings, he must employ artificial means to supply that which he has taken from the purifying forces of nature.

IT has been shown, in cities where plumbing regulations have been adopted, that the death-rate has decreased since these regulations went into effect; yet there are those who mock at sanitary plumbing.

PLUMBING is a necessary part of building construction. It is the most important part, and for this reason the very best should be secured. There should be no degrees in the work, but the best should always be employed.

THE demand, which is growing, for plumbers for sanitary inspectors of plumbing, is based largely on the efficient work in this regard by such inspectors, and the reasonableness of their qualifications for this special service.

INCREASE THE PENALTY.

Elsewhere will be found the full text of an act of Congress designed to prevent the spread of scarlet fever and diphtheria in the District of Columbia. The act, with one exception, will form a model for a bill for all cities. That one exception is the petty penalty attached for violations of the provisions of the act. It is enacted that, on the failure of any person designated to report within twenty-four hours the existence of a case of either of these diseases, he shall be subject to a penalty of not less than five nor more than fifty dollars; and in case of a second offense, the penalty shall not be less than ten nor more than one hundred dollars. For violations of other provisions of the act the penalty is the same. The penalty is not severe enough. What is a fine of five dollars compared with the mischief of a failure to report a case of scarlet fever or diphtheria within a proper period of time? Isolation and notification are the two great means of preventing the spread of these diseases, as well as some others. These, with proper disinfection, supply the efficient means of preventing epidemics of these fatal maladies.

One can imagine what would be the effect of a case of either of these diseases where these important preventive measures are totally disregarded. Then we may suggest that the violation of these provisions are as grave as the preventive measures are important, and the penalty attached should be more nearly commensurate with the crime. If these measures are to prove efficient, they must do so by the fulfillment of the law, and not by any merit of the law or virtue of the means provided. These means are efficient only when strictly carried out, and any law, to be of value, must provide penalties that will insure the end sought. The law, dealing with life and health as it does, is of great importance, but, as it stands now, the paltry fines imposed for its violations destroy its greater usefulness, rob it of its dignity, and lessen the regard both for the high office it was designed to fill and for the law itself.

The penalties provided by a law are considered to measure both the importance of the law and the gravity of the offenses it is designed to prevent. The penal provisions of this law suggest the query, is not an epidemic of scarlet fever or diphtheria of more damage to a community, to its health, its life and prosperity, than the value of five dollars? Should the physician or other person responsible for such an epidemic escape with the payment of five dollars, or fifty, or a hundred? True, money cannot pay for a lost life. It is a poor return for ill-health, and in this it is not intended as such payments. It is intended to induce or compel compliance with the law, and should be of such nature as would secure that end.

With such penalties provided, it would seem that the law was intended to provide a revenue, and care was taken not to make the fines prohibitory. This law is directed against a matter more serious than its penalties would indicate, More suffering and deaths result from a failure to make proper notification of the appearance of these diseases than from any other cause, and when a law is enacted to secure this notification and other preventive measures, it should provide a penalty great enough to secure the accomplishment of its mission. A law, like a cable, is no stronger than its weakest point.

OUR INVISIBLE FRIENDS.

In this issue will be found a very interesting, able and instructive article from Col. Geo. E. Waring, Jr., on the important subject of "The Relation of Ground-Water to the Health of the Community." Those who have followed the discussion of this subject in THE SANISARY NEWS will give a double welcome to this valuable addition to the literature touching this important matter. Col. Waring is a man of practical experience, close observation and learning, and is authority on matters of this nature. He has presented clearly and intelligently the generally accepted theory regarding the two forces in nature having to do with man's health and life—the pathogenic and non-pathogenic germs, or the disease-producing and the health-protecting micro-organisms; and the conclusions drawn are practical and of value. It may be profitable to go a little further and apply the practical deductions of this article to some trades and professions, the prosecution of which have a direct bearing on the general sanitation of a community.

The author has pointed out the important offices of the scavenger bacteria in reducing contaminating substances to an injurious state, when the conditions are favorable to the life and activity of these micro-organisms, germs of putrefaction, and the invisible hosts that strive to maintain the purity of virgin nature. The main condition necessary to the life of these organisms is a sufficient quantity of pure air. Yet it must be borne in mind that this host, in its continual warfare with pathogenic germs, is much like an army, and can be overcome with numbers. Pollutions can be thrown upon the earth until this army in the cause of health and the purification of nature is overpowered, and the results of triumph will rest with the invading hosts of disease. This fact is utilized in sewage farms in the employment of sufficient area and the intermittent process. From this process of decay and destruction arise noxious gases detrimental to the existence of the scavenger bacteria, and, if confined, is destructive of them. For this reason, sewers, drainage-pipes, etc., are ventilated in order that fresh air may be continually admitted, to sustain the life and energies of the micro-organisms engaged in maintaining the purity of nature, which abhors pollution as much as it does a vacuum. These facts in relation to these invisible allies of health are still further utilized in the employment of the flush for waste, soil-pipes, drains, sewers, etc. A quantity of water rushing down them is productive of good by the washing it gives; but this is not all the virtue of the flush. The air contained in the water, and the volume of air rushing along with it and drawn after, furnish the means of life and activity to the soldiery that has taken up arms against the invading foe of nature's purity, cleanliness and holiness. When the engineer provides the means of ventilating his sewers, he is supplying an essential element to the life of a host of scavengers which keep them clean. When the plumber traps and ventilates his system of plumbing, he is proving against possible mischief of pathogenic germs, and supplying the means of lire to their antagonistic organisms. From these and many more illustratious that could be given, it is seen how intimately is science connected with the every-day life of humanity, and to what some people regard as the rude employments of men.

NOTES AND NEWS.

A French writer has recently called attention to the fact that English lace is frequently charged with white lead.

Washing floors and shelves with strong pepper tea, or hot alum or borax water, will destroy ants and roaches.

Dr. Charcot, who has recently finished a long series of experiments with hypnotism, gives as his opinion that not more than one person in 100,000 would be likely to be benefitted by this mode of treatment.

From the use of a warm and forced blast into a furnace, a saving of from 10 to 15 per cent. in the fuel may be effected over what would be obtained from the use of a natural draft of cold air.—*The Stationary Engineer.*

Professor John Trobridge once said: "The difference between the scientific man and the unscientific man is, that one makes accurate measurements, while the other is satisfied with general knowledge, and does not ask "How much."

The United States Government Commissioner of Patents estimates that from six to seven eights of the entire manufacturing capital of the United States, or six thousand millions of dollars, is directly or indirectly based upon patents.

Miss Flora Grace, of Iowa, is the inventor of a cooking thermometer, which, instead of registering "summer heat," "blood heat" and "freezing point," marks the boiling point, the gently simmering altitude, and the varying baking points for meats, bread, cake and pie.

Sulphurous acid is now being used to act upon starch under pressure and at a high temperature. The product, after neutralization, is Schumann's universal gum, which is solable and extremely adhesive, and closely resembles gum arabic, which is now very scarce and dear.

It is claimed that an eastern chemist has discovered a process of making soap from corn. The discovery has excited considerable attention and promises to give not only a new corn market but to revolutionize the art of soap making. The soap made from corn is said to be absolutely pure and better than the finest toilet soaps now made.

Dr. Victor C. Vaughan has detected a new poisonous element in cheese, differing from tyrotoxicon, but has so far been unable to isolate it. Taken in sufficient quantities it produces vomiting and purging, and in animals, death. It has been decided that it is not a globulin or a peptone, but belongs to the class of so-called poisonous albumins.

The best way to clean brass, and the way used by the United States arsenals, is to make a mixture of one part of nitric acid and one-half part sulphuric acid, in a stone jar, having, also, a box of sawdust and a pail of clean water. If the brass is at all greasy, it should first be dipped in a strong solution of potash and soda, and afterwards dip it first in the acid, then into the water, then rub thoroughly with the sawdust. This will leave a bright, highly-polished surface on the brass.

A crack in a piece of metal is prevented from extending further by the well-known means of drilling a hole where the rent ends: but when the hole is not bored on just the spot, the crack is apt to continue beyond the hole. To facilitate the search of the exact point *Revue Industrielle* recommends moistening the cracked surface with petroleum, then wipe it and then immediately rub it with chalk. The oil that has penetrated into the crack exudes, and thus indicates with precision where the crack stops.

In order to give a fine brilliant black varnish to the surface of polished metal, like iron and steel, the following simple process is said by a French contemporary to be effective. One part of sulphur is boiled with ten parts of essence of terebenthine, and the oil which results is applied in a very thin layer to the surface of the metal that it is required to varnish. The oil has a brown colour, but when articles that have been painted with it are held on the flame of a spirit lamp or a Bunsen gas-burner, it assumes a brilliant black appearance which is very effective.

The necessity of having an invention well described and every novel feature of the invention defined in both the drawings and specification preparatory to filing in the Patent Office was well set forth by the late Judge Grier, one of the more distinguished of the patent law judges of the Supreme Court of the United States, when he said, "There are few things more difficult, even for well educated and practical lawyers, than to describe a new invention clearly, and point out the principle which distinguishes the subject of it from all things known before. As inventors are rarely experts, either in philology or law, it has long been established as a rule that their writings are to be scanned with a good degree of charity. But it is easy to abuse this liberality to the purposes of fraud."

On the fallacy of "clearness" as a test of purity of water, the following from Mayor Powell, director of the geological survey, makes a point of much importance. He is protesting against a proposal to pipe water to the executive mansion at Washington from a "clear" spring, which he says is presumably polluted with sewage from vaults and cesspools. He adds: "By a long series of experiments undertaken with a view to determining economic methods of precipitating, and thus removing the finally divided clay contained in the waters supplied in cities, it was found that there were many different mineral substances, each of which would cause the precipitation of the clay if added to the water in small amounts; but the most powerful precipitant—the one which produced the result by the most minute addition—was sewage. From the point of view of the sanitarian the limpid purity of the spring and well is a suspicious quality."

Prof. Koch has been making experiments respecting the influence of sunlight upon the growth of germs. The results are very significant, showing very clearly the important relation of sunlight to health, especially as a disinfectant. We quote a portion of his remarks as follows: "As to direct sunlight, it has been well known for some years that it kills bacteria with tolerable quickness. I can affirm this as regards tubercle bacilli, which were killed in from a few minutes to some hours, according to the thickness of the layer in which they were exposed to the sunlight. What seems to me, however, to be particularly noteworthy is that even ordinary daylight, if it lasts long enough,

produces the same effect; cultures of tubercle bacilli die in five to seven days if exposed at the window in compact masses."

The durability, elasticity, and general powers of resistance of metal goods of all kinds, especially piping, can be greatly increased by subjecting them to intense pressure, which is distributed equally over the interior and exterior surfaces. In order to convey strong pressure, water is chosen as a suitable agent, because, as a liquid, it transmits pressure equally in all directions. The articles to be treated are placed in a very strong reservoir of suitable dimensions. The reservoir is filled with water. Pressure is now applied by means of a hydraulic pump capable of producing a pressure equivalent to that of 8,000 atmospheres, or 8,000 by 15 lbs. per square inch of surface. This enormous pressure does no damage, because it is transmitted by means of water, which fills and surrounds on all sides the articles which are being dealt with. The effect of this treatment is to compress the metal slightly but effectively; its action is molecular and beneficial to a high degree. Articles that are thus treated are stronger in every respect, and the expense is comparatively trifling, the greatest item being, of course, the initial plant.

The modern subject of germs has brought to light a great number of avenues through which the causes of disease may come in contact with the body. The feather duster is evidently an excellent means of keeping germs stirred up and floating about in the air so as to facilitate their incubation. Evidently the use of this article in the sick-room is wholly out of place. Housewives and chamber-maids should invaribly protect the mouth and nose by tying a handkerchief over them, or by employing some other form of strainer for the breath, whenever the use of the duster is required, and after the duster has been used, the doors and windows should be opened to allow a free circulation of air until the floating dust has been removed. A room occupied by consumptives should never be dusted in this way, as there is great danger of inhaling the air containing germs of the disease, and thus communicating the affection to well persons. Undoubtedly, consumption has frequently been caught in this way.

Ptomaines is a term applied to a certain class of poisons found in dead bodies. These poisons were first discovered in 1875 by an Italian chemist. They have been found to be the frequent cause of death in cases which were formerly obscure. The distressing and not infrequent symptoms which sometimes result from eating canned fish, meat which has been kept for too long a time after the death of the animal, and in some instances cheese, and occasionally the eating of ice-cream, or even milk under certain circumstances, is due to the presence of these extremely poisonous substances. Some days ago, a physician died in Chicago, as the result of eating, at a restaurant, oysters which happened to contain ptomaines. The symptoms produced were violent vomiting and purging, and intussusception, or telescoping of the intestines, occurred, resulting in obstruction of the bowels and death. The writer has met a number of cases of poisoning by ptomaines as the result of eating oysters. Oysters are very likely to contain ptomaines. This is also true of all shell fish. This is one good reason, at least, why the bivalves should not be used as an article of food.

MICROBES IN AIR, WATER, SOILS AND FOODS IN RELATION TO INFECTIVE DISEASES.*

[Continued from Page 77.]

HOW THEY GAIN ADMISSION INTO THE BODY.

1. *Action of Winds.* That aerial communication in many diseases is common cannot for a moment be doubted, but when the organism is in the soil this method of transmission must be difficult. We have, at a former period, referred to a superficial evaporating zone of soil which contains organisms in abundance, and when, under the heat of summer, drying takes place, it is not difficult to imagine the bacilli of typhoid becoming dry and detached, floating away with air currents, and falling into water supplies, milk, etc., or being taken directly into the mouth and then swallowed. Capillary action, upward air currents, and worms, may raise organisms from the lower zones to the higher, and bring them under the influences to which the upper zone is liable. The experiments of Frankland, showing the diminution of organisms in water by filtration, must be kept in view.

2. *Action of Water.* It has not been found that bacteria can travel far through soils, even by water currents, but where there are pores and openings in the soil they undoubtedly can pass to the subsoil water, and thus into water supplies. Water mains, when leaking, and during intermissions of flow, may, and do undoubtedly, draw in specific contagia. The incidents of the Caterham outbreak of enteric fever point to the pollution of the subsoil water and the transmission of the typhoid bacilli a considerable distance through soil.

3. *By the products of the Soil.* Vegetables, fruit and flowers may be the vehicles by which the contagion is carried from the soil to the person attacked, and this means of communication should be kept in view, especially in connection with cholera.

4. *Flies and Insects* may be the intermediate agency.

5. *Digging and turning up of the soil* renders it liable specially to the conditions under number one and four headings.

6. One important means, especially in the case of children, has to be noted—viz: by means of the fingers and hands children frequently play with soil, fouling their hands, and it is easy to understand how they may pass the specific organism of typhoid from the soil into their mouth. I had a case, not long ago, attributed to this.

In concluding my observations on soil and bacteria a short reference must be made to Emmerich's observations on the excessive amount of micro-organisms in the damping material under floors of dwelling houses. In a prison where there had been an epidemic of pneumonia, the bacteria of this disease were found in enormous numbers in the damping material under the floors. This soil under the floors must not be neglected when looking for possible factors in the production of infectious diseases.

MICRO-ORGANISMS IN FOODS.

The references we have already made to the role which microbes have in causing fermentation and putrefaction in various animal and vegetable substances, and further, that various microbes are found in large quantities in air, water and soils, prepare us for believing, *a priori*, that they will be found in the various articles used for human food. The literature bearing on the subject is so extensive that a selection of certain articles of food, in connection with disease-producing microbes, must alone be referred to.

Milk is the typical food for purposes of illustration, and it occupies the unique position of being a typical nutrient medium for microbes, as well as being the typical food for infants.

I need not enter into any discussion regarding milk as a suitable food for microbes, further than state that Lister, in a paper on "Lactic Fermentation," states that milk serves as a food for nearly all organisms. Woodhead, Klein, Cruickshank and Koch, all refer in their works to milk as a good fluid medium for cultures. It, however, requires careful sterilization to destroy organisms that gain entrance from the time it leaves the cow (as well as before, in some cases).

In speaking of fermentation it was mentioned that the lactic acid fermentation was produced in milk by its milk-sugar being converted into lactic acid, and the milk becomes sour. Lister isolated a special organism, the cause of these changes; but subsequent experience does not limit these to one, but as many as fifteen varieties are believed to be able to produce the lactic fermentation.

Other well-known fermentations in milk are the butyric, and the formation of "blue milk."

These are mentioned as examples, showing that milk is a suitable medium for the growth of ordinary microbes, but of more importance to us as sanitarians is the question of the suitability of milk as a medium for the growth of disease-producing microbes. Long before it was known that tuberculosis was due to a microbe, it was known that calves could be infected by sucking cows, the subjects of this disease; but the discovery of the bacillus in casual relationship to tuberculosis, and the fact that tubercle bacilli are to be found in the milk of tuberculous cows, has raised the subject to one of the first importance, from the enormous prevalence of tubercle diseases in man and the domestic

*Read at the Sixteenth Annual Meeting of the Sanitary Association of Scotland, held at Perth, July 24, 1890, by T. G. Nasmyth, M. D.

animals, and the large and distressing mortality as a consequence. Bang, of Copenhagen, has further shown that the bacilli may be found in cream, butter-milk and butter. I need not raise the question at this time whether it is necessary for the presence of bacilli in the milk, that the udder should be affected; late experiments by Dr. Ernst in America seem to show that this is not necessary, but if the animal is affected with tubercle in any organ, the milk may contain the bacilli. There is another means of infection from the cow, by the discharges from its nose or mouth, containing bacilli, becoming dry and volatile, floating through the air, and into the milk, or even into the lungs of human beings. This is highly possible, as dried tubercle matter has been found to be infective after 186 days. It is scarcely necessary to add that the bacilli are found in the flesh and organs of the animals affected; and flesh, unless thoroughly cooked, may convey the contagion to the human being.

Scarlet Fever. The extensive and apparently conclusive experiments and observations of Klein point to a special micrococcus as the cause of scarlet fever; and, further, and of the utmost importance to preventive medicine, that this organism is not only capable of being carried by milk, but that it is found in cows suffering from a peculiar eruption on the teats and udders. The conclusions deduced from the investigations can be put only shortly, and as given by the Medical Officer of the Local Government Board:

1. Certain micro-organisms (micrococci) in the organs and tissues of certain cows, and in the discharges from their teats.

2. Cultivations of these micrococci.

3. Inoculation of calves from these sub-cultures, or by the material in the cows, produced a disease corresponding to that found in the cows, and to scarlet fever.

4. Micrococci identical to those found in the cows were found in the heart's blood of the inoculated calves.

5. The same organisms are found in the blood of scarlet fever patients.

The subject is too voluminous to be entered into here, and this brief epitome of a vastly important series of investigations must be accepted.

Tphoid Fever. Now known to be caused by a definite organism which can be grown in milk. The bacillus forms spores, which retain their vitality for a long time; in a dry state, according to Gaffky, for three months.

Cholera, caused by the well-known organism, the comma bacillus. This organism has been referred to already in reference to water and soils, and at this time I have simply to state that an outbreak was traced by Dr. Simpson, the Medical Officer of Health for Calcutta, to milk contaminated with the specific organism of cholera. In this case a ship's crew was affected. Of 14 who did not drink the milk, all escaped. Of 10 who drank the milk, 9 sickened; 5 with diarrhœa and 4 with fatal cholera; and the one who escaped only had a "thimbleful." The milk was proved to have been polluted with water in which cholera excreta had gained admission.

Certain so-called preservatives for milk—soda, lime and others—counteract the acidity due to lactic acid fermentation, but have an injurious action in rendering the milk alkaline, and thus more favorable for the growth of pathogenic organisms. Experiments carried on by Drs. Lazarus and Ritter at the Hygienic Institute of Breslau, showed that in milk carefully sterilized pathogenic organisms grew well. In non-sterilized milk, the acidity soon destroyed the comma bacillus (cholera). After milk has been sterilized for dietetic purposes, the flasks in which it is contained should be plugged with sterilized wood.

Of great importance, from the excessive mortality, are the digestive disturbances of bottle-fed infants, and due to the decomposition of milk in the india-rubber tubes by microbes. The shorter the tube, and the cleaner it is kept, the safer; but it is impossible to sterilize an india-rubber tube by mere brushing and washing. Short glass tubes are to be preferred, from the possibility of cleaning and disinfecting them by boiling. Tyrotoxine, a poisonous alkaloid, has been found in fermenting milk. It is not the time to refer to the numerous epidemics on record, of scarlet and typhoid fevers especially, being traceable to milk acting as the vehicle of communication, further than to say, that experimental cultivation of the specific organisms of these diseases are entirely corroborative of this connection. Time does not permit discussing at any length the occurrence of various microbes in other articles of food. The typhoid and cholera bacilli grow on dead vegetable matter, such as potatoes, and in actual laboratory experiments potatoes are used for cultivating media. The tubercle bacilli, of course, are found in various tissues and organs of animals and man. The bacilli of anthrax are found in the blood of animals, and affect man when introduced, producing malignant pustule and woolsorters' disease.

Outbreaks of fatal diseases have frequently been traced to the ingestion of meats which had been acted on by certain organisms, such as occurred at Welbeck in 1880, and at Nottingham in 1881, and investigated by Klein.

The dangerous or unpleasant effects which are caused by the ingestion of various kinds of fish, especially shell-fish, are probably due to the formation of poisonous alkaloids, due to microbes. Thus we hear of outbreaks of disease from eating mussels, oysters, and other molluscs, and often attributed to poisoning of these by sewage. There are probably organisms in sewage which have the effect of producing dangerous compounds in oysters and other shell-fish. Then there are some kinds of fish which, if used in the condition called "high," produce most dangerous symptoms, and are probably due to some alkaloidal poison.

Microbes in Clothing.

The presence of microbes in clothes must just be mentioned, but of very great importance, from liability of specific contagion being thus conveyed, and to emphasize the necessity of strict disinfection of such articles after having been worn by infected persons.

Bacterial Immunity.

The question, "What are the conditions which give us immunity from the swarms of bacterial life which surround us on every side?" is one of the greatest importance, and concerns the general public fully more than the methods and observations carried on in many laboratories in many countries, which have proved the association of these organisms with the production of disease.

In the first place, it must be carefully borne in mind that of the clouds that encompass us, only a small proportion, as far at least as modern research shows, are endowed with disease-producing functions; and for the action of those that are pathogenic, a great many circumstances must co-exist. The bacteria of disease are selective in their choice of breeding ground. Thus, the microbe of enteric seeks certain glands in the intestine; of diphtheria, the mucous membrane of the throat specially; of erysipelas, the skin; cholera, the intestinal canal, and so on with the others; and failing to meet these organs or tissues, they will not harm the individual. Besides this selective action, there must be a prepared condition of the selected parts, as the healthy tissues and glands of the body have an antagonistic action. Metschnikoff's experiments show that a battle takes place between bacteria and leucoytes, and that the former are taken up and digested by the latter. The gastric juice can destroy certain pathogenic microbes.

There must be a condition either of local or general "low vitality," or of both combined. If we have been drinking polluted water, or eating unripe fruit, or in any way interfering with the normal performance of digestion and alimentation, we render ourselves liable to cholera during its prevalence, and to typhoid at all times. If we have been breathing air polluted with the emanations of decomposing organic matter a low state of health is induced, and a weakened mucous membrane, which the diphtheria attacks and overcomes.

When referring to bacteria in various media, the conditions of growth were pointed out, and the absence of some or all of these conditions is of the utmost importance in securing immunity from their attack, and from the general prevalence of epidemic diseases.

Space forbids more than mere reference to the immunity due to vaccination and inoculation, depending on the development of a mild form of a particular disease from organisms "attenuated," artificially or naturally. The action of drugs on microbes in the tissues and fluids of the body must also be noted. The action of mercury, iodide of potash, quinine, etc., in controlling certain diseases, are, without doubt, due to their antiseptic and disinfectant actions.

In conclusion, the greatest immunity which the sanitarian can promise comes from attention to the cardinal rules of hygiene—pure air, water, food, clothes and dwellings.

TO PREVENT THE SPREAD OF SCARLET FEVER AND DIPHTHERIA.

The following act, originally recommended to the committee of the House and Senate of the District of Columbia by the Medical Society for the district, has been passed by Congress. It is an act to prevent the spread of scarlet fever and diphtheria in the District of Columbia, and is believed to be a model bill for municipalities:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this act it shall be the duty of every registered practicing physician or other person prescribing for the sick in the District of Columbia to make a report to the health officer, on forms to be furnished by that officer, immediately after such practitioner becomes aware of the existence of any case of scarlet fever or diphtheria in his charge; and in case such person should fail to so report within twenty-four hours he shall be subject to a penalty of not less than five nor more than fifty dollars, and in case of a second offense the penalty shall not be less than ten nor more than one hundred dollars. In case no physician shall be in charge of such patient, the householder where such case occurred, or person in charge thereof, the parent, guardian, nurse, or other person in attendance upon the sick person knowing the character of the disease shall make the report above mentioned, and in case of failure to report shall suffer the same penalties as provided for physicians in this act.

SEC. 2. That it shall be the duty of the health officer co-operating with the attending physician to cause a suitable placard, flag, or warning sign to be displayed from the front of the premises or apartment where any one case of scarlet fever or diphtheria is present. It shall be unlawful for any person to remove such placard, sign or warning flag, when so placed, without permission of the health officer, and it shall be the duty of said health officer, in conjunction with the attending physician, to cause the premises to be properly disinfected. and to issue the necessary instructions for the isolation of the patient.

SEC. 3. That no person shall visit or attend any public or private school, or place of public assemblage, or appear on the public streets or in the parks while affected with scarlet fever or diphtheria, and any adult person, parent or guardian of a minor convicted of having knowingly violated the provisions of this act, shall, upon conviction, forfeit and pay a sum not less than five nor more than fifty dollars; and it shall be the duty of physicians while in attendance upon cases of scarlet fever or diphtheria to exercise such reasonable precautions to prevent the spread of the said diseases as may be prescribed by the health officer of the District of Columbia in regulations.

SEC. 4. That no person who has convalesced from diphtheria or scarlet fever shall be allowed to attend any public or private school, seminary or college until the attending physician shall have furnished a certificate that said patient has fully recovered, and that there is no danger of infection to other persons. All persons who shall, after convalescing from diphtheria or scarlet fever, visit schools, seminaries or colleges, without providing themselves with such certificates, shall suffer the penalties provided for in section one of this act.

SEC. 5. That the provisions of this act shall apply to every ship, vessel, steamer, boat or craft lying or being in the rivers, harbors, or other waters within the jurisdiction of said District, and to every tent, van, shed, hovel, barn, out-house, cabin, or other like place, as if the same were an ordinary dwelling.

SEC. 6. That the word "regulations," as herein used, shall be held to mean also rules, orders and amendments. The words "person in charge thereof" shall be held to mean the owner, his agent, or factor; the tenant, his clerk, or representative; the nurse or any one or more persons who by reason of their position are charged with the management or care of the premises, or interested in the person afflicted. The words "practitioner of medicine," or "practitioner," shall be held to include all persons who undertake to treat persons afflicted, either gratuitously or for pay.

SEC. 7. That any person who shall knowingly make, sign or deliver any false report or certificate herein provided for, upon conviction thereof in the police court of said District, shall be fined not less than five nor more than fifty dollars, and, in default of payment thereof, be committed to jail for not less than one nor more than twenty days.

SEC. 8. That the expenses necessarily incurred in the execution of the provisions of this act shall be borne from the general appropriation for the maintenance of the health department of the District of Columbia, and the jurisdiction of civil and criminal procedure in the enforcement of this act is hereby vested in the police court of the said District, with the same right of appeal as in other civil and criminal trials in said District.

THE RELATION OF GROUND-WATER TO THE HEALTH OF THE COMMUNITY.

BY GEORGE E. WARING, JR.

Nearly every community, in all countries, lives on a soil which, below a certain depth, is saturated with water. This is sometimes very near to the surface, and sometimes very deep below it; sometimes nearly quiescent, and sometimes in active movement; sometimes subject to marked rise and fall under the influence of rain and drought, sometimes practically uniform in its elevation. Sometimes it is subject to the action of rising and falling tides even though its level is considerably higher than that of the tide-water, and the distance somewhat remote.

I have said that this water is sometimes nearly quiescent; it is never entirely so. In some form or other it is receiving additions and either by evaporation or leakage it is undergoing waste. Following its tendency to maintain its level, waste at any point must be supplied by a flow from other points, and an addition at any point must be equalized by a flow toward other points. Sometimes rims of elevated clay or rock maintain in the soil something approaching the conditions produced by a mill-dam, holding the line of saturation at a given elevation, which, however, in this case is rarely level, because of the tendency to loss by evaporation or leakage at one part more than another, and because of an inflow from outlying sources. As a rule, rivers are fed chiefly by underground flow. During heavy rains a portion of the downfall flows off over the surface and goes directly to the river. Most of it enters the ground, raises the level of its water of saturation, forcing it forward toward the nearest drainage-line, whether brook, creek, or river. Where the flow toward these drainage-lines is considerable, the water in the soil is always higher, sometimes materially higher, than the water of the river, save only when the latter shall have been temporarily raised by an inflow of surface-water. It requires a certain amount of extra elevation or head to force the water forward toward the river, in order to overcome the friction of the particles of earth among which it is flowing. In coarse gravel this difference of head may not amount to much, but as the obstructing particles become finer, increasing the friction surface and reducing the size of the space through which the water must run, more and more head is required to produce the discharge. If the discharge is into water of permanent level, the depth of the water from the surface at any given point may remain approximately the same, but if the discharge is into a contiguous body of water, subject to a strong tidal rise and fall, the elevation of the ground-water for some distance back from the shore will be subject to corresponding fluctuations. Although the level of the ground-water be some feet higher than the highest high tide, it will fall somewhat as the tide falls. and will rise somewhat as the tide rises, even although its lowest surface elevation during low tides may never run so low as the level of the highest tides.

Fifty years ago, a knowledge of the laws governing the existence and movement of ground-water had little practical interest, save as they related to the digging of wells, unless, indeed, the water rose so high as to invade cellars or to saturate porous foundation walls. Now, the case is greatly altered. While we have yet a vast deal to learn as to the sanitary bearings of ground-water, and especially as to the relations of the rise and fall of this water to the production or fostering of certain epidemics, we have learned enough to know that, either in this water or in the ground's breathing-space between the surface of the water and the open air, we have to look for some of the most serious dangers that be-

set us, and that the whole question of sanitary drainage, the purification of sewage, and the lessening of malaria, must here seek its most important solution.

Nothing that may be said in a discussion of this sort, concerning the character, habits of life and sanitary relation of those microscopic forms of life which now engage so much of the attention of the biologist, is to be accepted as a scientific statement. Indeed, it is difficult to say wherein the professional pursuit of bacteriology, the line between science and speculation, lies. At the same time, enough has been demonstrated to show that certain grave, and in some cases fatal, diseases—the chief scourges of the human race, the sources of suffering, inefficiency and depression, as well as of death—are fostered and transmitted, and are often given epidemic proportions, through the development of microscopic forms of life. If we err at all, we shall err on the safe side in assuming that there is no longer a question as to the relation between these microscopic germs and our most serious diseases. No more than in a discussion as to the origin of these germs are we able to say, with scientific accuracy, what are the conditions most favorable to their development or to their destruction; but we may safely assume that the water of the soil and the condition of the breathing-space above the water may have, and under certain conditions do have, a very marked influence on the character and development of disease-producing organisms, and on the opportunities for their reaching and infecting the human subject.

Whether or not all or most of the disease-producing microbes can escape from the soil into the air under natural conditions, it seems clear that at least the causative microbe of malarial fever does so. The probability is that most of the pathogenic microbes in the soil are conveyed to their field of operation in drinking-water, sometimes by a flow of polluted ground-water into wells, and sometimes by its flow into small streams from which drinking-water is obtained. That infection may be communicated by ground-water has been proved beyond question. The degrees to which infection may be carried, through a soil of ordinary consistency, has not been determined; but the probabilities are that unless there are sand or gravel strata, or rock-fissures, carrying the stream faster than it can be filtered, infection will not follow the flow.

Whether or not ground-water containing slight organic impurities can serve as a breeding medium for microbes has not been determined. That it does form a field for their multiplication when accumulated in wells, there cannot be much doubt. The one undeniable conclusion that must be drawn—a conclusion forming one of the fundamental bases of sanitary hypothesis—is that polluted water in the ground is always liable to produce disease among those living over that ground, whether breathing its exhalations as drawn into cellars, when the surface is frozen, and the breathing-space of the soil becomes a source of the draft of chimneys, or drinking-water drawn from the subterranean supply. The unquestionable result from this is that there can be no absolute safety short of securing absolute purity, so far as organic matter is concerned, of the ground-water, which implies, of course, the purity of the soil itself. If we discharge filth through leaking sewers, or by soakage from leaching cesspools, or from the deposit of organic wastes or of dead bodies, below a certain depth from the surface, we are endangering the purity of the soil itself, and especially of the water flowing through or standing in it. Here lies the most obvious and direct relation between ground-water and the health of the community. The water itself is not harmful, save from its indirect effect on the hygrometric condition of the air in which we live. But it is probably to be regarded as a field for the multiplication of microbes, and it is surely to be regarded as a means for the transportation of these from one point to another, when its movement is not obstructed by a fine soil of measurably uniform texture. These effects, indeed, belong to elementary knowledge of the subject, and are familiar to all who have given even casual attention to it.

There is one condition, however, which is not so generally understood, but which seems to be clearly established: This is that it makes a very great difference whether the organic matter by which the soil and the ground-water may be contaminated is introduced into the soil at or near the surface, or at considerable depth. A discussion as to what takes place in tbe decomposition of organic matter under different circumstances is rather delicate ground, but the following may be accepted either as being correct or as indicating results which are produced by some other process than the one indicated: This theory is that the putrefaction of organic matter and the nitrification of the products of putrefaction are due to specific organisms which have the power to destroy not only the organic matter itself, but also those specific microbes which produce infection; also that these putrefying and nitrifying organisms can grow and multiply only with a sufficiently free access of air. Searches made for them at various depths seem to have established the fact that while in ordinary soil they are excessively abundant within a few inches of the surface, they are excessively rare at a depth of two feet, and that they disappear entirely at a slightly greater depth. It is probable, however, that they are capable of descending as far as their pabulum can be carried by direct progression from the surface, provided a sufficient supply of air can reach the same depth; so that if we thoroughly underdrain a piece of porous ground and dose it heavily with sewage, the water descending through the soil will deposit its impurities to a greater and greater depth, and that as the condition of saturation ceases, after the temporary application, air from the surface will take the place of the water and establish colonies of microbes at increasing depths.

A practical application of this theory is made in the various forms of sewage irrigation. It is known, that if, whether by direct flow at the surface, or by escape from pipes laid a short distance below the surface, the application of sewage is not too great and is sufficiently intermittent, suitable soils become charged with scavenger bacteria at increased depths and the power of purifying sewage, that is the population per acre that may be served is increased proportionately. This theory, that scavenger bacteria are active only in the upper layers of the soil answers the question so often asked: "Why, if filth can safely be delivered into pipes lying a few inches under the surface, may it not as safely be delivered into cesspools or filtering wells leaching into the lower strata of the soil?" Filth delivered at, or near, the surface is immediately subjected to the action of the scavenger bacteria and is destroyed by putrifaction and nitrification, as are its infective microbes; while that delivered at a depth where sufficient air is not present is subjected to a decomposition of another, and possibly dangerous character, the multiplication of its infective microbes being favored, in part perhaps by the character of this decomposition and in part by the absence of scavenger bacteria. If, as is altogether probable, as in fact seems to have been clearly demonstrated, ground-water flowing through or near privy vaults, cesspools, and the graves of cemeteries, is liable to infection from the sources indicated, that infection constitutes a menace to all who may become liable to infection from the use of that water as a beverage and at times, perhaps, by exhalations from it.

It is clear, therefore, that while the water falling from the heavens on the surface of the ground, even though it may have been manured with night-soil, is incapable of carrying dangerous elements to the ground-water, and though sewage discharged with proper precautions and with sufficient intermission on to the surface can contribute only a purified addition to the water of the subsoil, and while both of these processes may be carried on systematically without danger to health, any method of disposing of liquids fouled with organic wastes which delivers them unpurified into the subsoil, as well as the deposit of the bodies of the dead or of masses of filth at any considerable distance below the surface, is a source of danger constantly to be apprehended.

Whether or not the theory on which this opinion is based is destined to withstand the ultimate investigation of bacteriologists, the results for which it seems to account are confirmed by all experience and observation that has come to the knowledge of sanitarians. The conclusion is not to be doubted that so far as infectious diseases of a zymotic character are concerned, we have nothing to fear from ground-water if we keep it pure, and we have everything to fear if we allow it to become impure. The practical results of this conclusion must be that the greatest attention should be paid to the manner in which we dispose of our liquid waters. If we are obliged to deposit them in receptacles in the ground, these should be absolutely tight, not probably tight, but as tight as a bottle.

If we convey them from our houses through drains connected with sewers, every portion and every joint of the drains and of the sewers must be absolutely tight. Drains and sewers are always laid in our climate at a depth beyond which the purifying action above referred to ceases, and the same objection exists to the escape of their contents into the ground-water as would attend the delivery of the mouth of the drain in a brook or river. The communication and contamination may be less direct but it is equally positive. It is rarely necessary to say that in the construction of house drains and sewers, as ordinarily laid, even with the best materials, and under the best specifications, but with insufficient inspection, leaking joints are not a rare exception, and that, while the great volume of the flow follows the drain to its outlet, its oozings along the route are sufficient to jeopardize the safety of the community.

I would be very far from intimating that it is not generally the wisest course to provide communities with an abundant supply of water delivered into houses, but I can conceive of a condition where this is not necessary for the best sanitary results. In a town where there are no cesspools and no privy vaults, where there are no interments in the water-shed, and where all drains and sewers are so absolutely tight as to insure the ground-water against contamination, and where no impurity can in any way reach the subsoil, there seems to be no reason why ground-water may not be perfectly safe for domestic use.

The relation of ground-water to malaria, or fever and ague and neuralgia, are in one sense too well-known to need discussion.

In another sense, they are too little known for positive discussion to be possible. We know very well that in the great majority of cases, where malaria attends an undue moisture of the soil, it may be removed, for good and all, by suitable underdrainage. But we know of other cases, as in the dry plains of the far West, where nothing approaching a swampy condition ever exists, where even a light shower of rain may produce serious malarial conditions. All that can be said positively is that most of us who have a practical interest in malaria live subject to the undue moisture of soils at the East, and not to the arid sources of malaria in the far West, and that our practical remedy for this scourge is to withdraw the water of saturation to a sufficient depth to prevent the development of the malarial microbe in the surface soil.

OBITUARY—MARTIN MOYLAN.

The report of the sudden death of Martin Moylan startled his many friends throughout the country on Wednesday morning, December 17th. Mr. Moylan had been suffering for some time with rheumatism and a slight throat trouble, but his family and friends did not think his illness serious. He expressed himself as feeling unusually well for several days before his demise, and on Tuesday evening, December 16th, he was playing with his children before they retired, and about nine o'clock remarked to his wife that, since he had had such a lively day, he would retire. After retiring, a friend called, and Mr. Moylan sat up for a few moments to talk with his guest, and called for a cigar. After lighting the cigar, he called to his wife, stating that he believed he had hurt his throat, and expired within a moment from the bursting of a blood-vessel in the neck. Medical attendance was summoned, but all efforts to revive the prostrate form were in vain.

The Chicago Master Plumbers' Association, of which he was an active member, called a special meeting on the 18th to make arrangements for the funeral, and to draw up a fitting set of resolutions. Addresses were given by the different members of the association which indicated the strong attachment and brotherly feeling toward their departed brother and friend. The burial occurred on December 19th, and the remains were interred at Mt. Olivet. Very Rev. P. J. Gleeson, of Nashville, Tenn., an old-time friend and schoolmate, preached the funeral discourse. The floral tributes were very large and beautiful. The Chicago Master Plumbers' Association presented a massive column of flowers; Mr. J. R. Alcock, his partner, gave an anchor of roses, broken in two, representing the severed partnership; the children of the deceased gave a pillow of roses, and the employes of the firm of Moylan & Alcock presented a handsome design with the words "Gates Ajar" interwoven among the flowers.

The funeral was largely attended by the plumbers of the city, the Chicago Master Plumbers' Association attending in a body. A large number of friends from out of the city were present to pay their last respects to the departed, among the number being Mr. Geo. Higginson, of Newark, N. J.

Martin Moylan was born November 11th, 1848, at Gibbet Hill, near Nenagh, County Tipperary, Ireland, where he remained until his eighteenth year, when he came to the United States and located in New York City. He learned his trade with Nunnery & Ford, on Broadway, and came to Chicago in 1874, where he entered the shop of Archie Wilson, on Twenty-second street. Mr. Moylan remained with Mr. Wilson about one year, when he opened a shop of his own on Twenty-second street, where the present shop of Moylan & Alcock is situated. The first of January of 1889, Mr. Moylan associated with him in business J. R. Alcock, the present Secretary of the National Association of Master Plumbers, which partnership existed at the time of his death. On July 24th, 1879, Mr. Moylan married Miss Mary E. Campion, of Newark, N. J., who survives him. Of this marriage nine children were born, seven of whom are now living. As before stated, Mr. Moylan was a schoolmate of Very Rev. P. J. Gleeson, Vicar-General of the Nashville (Tenn.) diocese; also of Mr. Finerty, editor of the *Citizen*, and Rev. M. Meagher, pastor of the Catholic Church in Ridgeway, Pa.

He was one of the first delegates from the Chicago Association to the National Association of Master Plumbers, and always held a high place in the councils of the National body. He was very fair-minded, and wanted to see justice given to all. Whenever any difference arose between societies, or individuals, both parties would say: "We are willing to submit our difference to Martin Moylan;" and on many an occasion has he set warring factions in harmony with each other. Mr. Moylan was a very voluminous writer, and contributed many valuable articles on plumbing and sanitary science to the different plumbing papers. At the St. Louis Convention of Master Plumbers he won a $50 prize in the essay contest. He was always very devoted to his family, with whom he spent all his moments when not engaged in his profession, or working for the Master Plumbers' Association. The members of his fireside were always happiest when he was present, and his many friends knew him only to love those sterling qualities which made the kind father, the loving husband and the true friend.

AMONG THE PLUMBERS.

Ratz & Lawrence, the enterprising plumbing firm, of Toledo, Ohio, will move into new and more commodious quarters on January first.

G. H. Sutherland, of Walla Walla, Wash., will remove his place of business about January 1st, from the Burrell building to his new store on Main street.

The Health Department of Chicago will ask for $355,056 for next year as an appropriation for the scavenger teams alone. This year there were 225 teams employed in this work but the rapid increase of the city in population will necessitate the employment of 325 teams for this purpose next year.

The Galveston Sanitary Association has been incorporated with a capital stock of $50,000. Any information may be obtained from H. B. Cullumot, Galveston, Tex.

Frank Morris, of Bloomington, Ill., spent a few days in the city last week looking up old acquaintances and purchasing a nice line of new goods.

The Chicago plumbers are not the only members of the profession who suffer from thieves. The plumbing shop of Mr. Radans, at Bristol, Pa., was burglarized a few weeks ago and the owner is now compelled to lay in a new stock of plumbing goods.

F. E. Baxter, of Baxter & Co., Lima, O., has just recovered from a severe attack of sickness and made his first trip to the city last week, since his recovery. Mr. Baxter reports business good in his locality and while in the city made some large purchases of goods for his company which is getting its share of the business in Lima.

Thomas Acres, of Lancaster, Pa., has recently made a trip throughout the United States with a view of locating in some good place to carry on the plumbing business, and has come to the conclusion that Wheeling, W. Va., is the best place for him. His friends may find him in this city in the future.

Nicholas Spang, the Eastern representative of the L. Wolff Manufacturing Company, is spending the holidays in Chicago, among his many friends. Mr. Spang has had quite a successful year this season, and says that there is every indication of an enormous business in his territory during the coming year.

Mr. Gannon, of Cairo, Ill., will do the plumbing work in the new marine hospital of that city.

A. F. Waters reports everything moving lively in Laporte, Ind. He has several nice jobs of plumbing work on hand, and ran up to Chicago last week to purchase the goods for the same.

Kelley & Jones not only do a large amount of plumbing work in their own city, Pittsburg, Pa., but they get some handsome contracts outside of Pennsylvania. They have just finished a nice job in the First National Bank building at East Liverpool, Ohio.

Billy Scott, of Boston, will probably open a branch office in Chicago next spring. Billy says the East is becoming too contracted for his business, and he intends to seek additional territory. We extend to him the right hand of fellowship, and assure him that there is always more room for energy and push in Chicago.

T. J. Clark & Son, of San Francisco, Cal., recently did some plumbing work in Oakland, Cal., and the local authorities are making things unpleasant for the firm because it did work in their city without a local license.

Two members of the Chicago Steamfitters' Association, Edward B. Whitney and Peter Green, were before Justice White on December 18th, for an alleged assault on Allen McClane, a non-union man. The Justice ordered the prisoners remanded in $200 bonds, and ordered the officers to inquire for evidence to sustain the prosecution for intimidation.

John Mayne & John Fountain is the name of a new firm of plumbers at Huntington, Ind. They have opened their shop in the Bippus building, on Washington street.

E. H. Whitney, the Northwestern representative of the L. Wolff Manufacturing Company, has returned home from a very successful year's work in his territory. Mr. Whitney is a practical plumber, which, no doubt, contributes largely to his remarkable success in selling goods. He speaks in very flattering terms of the West and Northwest, and predicts that this section of the country is to become the ruling portion of the Union. Mr. Whitney secured some very fine orders for the plumbing goods to be placed in the elegant new mansion of A. W. Chamberlin in Denver, Colorado.

H. H. Meerhoff, of Richmond, Ind., was in the city a few days ago, in the interest of his growing business in the Hoosier State.

E. H. Whittaker, the efficient plumber who recently purchased the plumbing business of W. T. Williams at Frankfort, Ind., is doing a rushing business in that city.

Charles G. Bosche is proving himself to be a valuable addition to the list of plumbers at Monmouth, Ill.

E. W. Brown, of the firm of Davis & Creswell, Denver, Colo., recently spent a number of days among friends in this locality. Mr. Brown devoted a large portion of his time to looking over the handsome exhibits in the spacious show-rooms of the L. Wolff Manufacturing Co.

James McDonald, who recently opened a plumbing shop at 556 West Van Buren street, is doing a good business in his new quarters.

Attention is called to the advertisement, in another column, of James B. Clow & Son, Chicago, of their Improved Royal Granitine Laundry Tubs, which they claim are superior to anything in this line offered to the trade. This enterprising firm has just issued, for the use of the plumbing trade, a beautiful lithographic card, size 11x14 inches, showing how plumbing is required to be done in Chicago. It is from designs by Mr. Andrew Young, first President of the Master Plumbers' Association, now Chief Inspector of the Health Department, which have been approved and adopted by Dr. Swayne Wickersham, Health Officer. Plumbers and architects may obtain copies of this card by addressing James B. Clow & Son, Chicago.

National President Griffith is now swinging the circle in the South. He attended the meeting of the American Public Health Association, which recently met at Charleston, South Carolina. Mr. Griffith will look after the interests of the plumbing trade throughout the South before he returns. Mr. Andrew Young is with Mr. Griffith, and both together will represent Chicago as she should be represented in the national councils of physicians.

J. D. Reilly, the genial representative of J. B. Clow & Son, has just returned from a fourteen-weeks' trip through the Northwest. While absent, Mr. Reilly visited Utah, Montana, Oregon, Washington, Colorado, North Dakota and California. He reports a successful trip and everything booming in this section of tne country. He thinks that Portland, Oregon, is making remarkable strides in the plumbing business.

At the last meeting of the Chicago Master Plumbers' Association quite a number of strong speeches were made, urging the Legislative Committee to take immediate steps toward securing a law that would protect the learned and skilled master plumbers from having those admitted to their ranks who do not know enough to last them over night, and who scarcely know enough to bend a piece of lead pipe. It was argued that the requirements for a plumber's license must be raised, and that at once. A motion was passed to instruct Ex-Alderman Pat. Sanders to begin his labors at once. Mr. Sanders, within a day or two, sought Alderman Ryan, and they both visited Mayor Cregier, before whom they related their "tale of woe." They requested an examining board, similar to the Board of Examining Engineers, to examine all plumbers, both old and young, as to their ability to continue in and carry on the plumbing trade. In this manner, they argued, would it be possible to weed out incompetent workmen and secure healthy and happy homes for the citizens of Chicago. They also asked that Chief-Inspector Young's force of plumbing inspectors be increased to twenty-five. The present force is entirely inadequate to the growing demands in this department. The Mayor approved the plan to have an examining board, and an ordinance covering this point will be drawn up by Alderman Ryan and presented at the next meeting of the council,

CHICAGO HEALTH DEPARTMENT.

On Wednesday afternoon Commissioner of Health Wickersham was presented, by the employees of the Health Department, with a large portrait of himself, handsomely framed. The presentation speech was made in a few well-chosen words, testifying to their high regard for their chief. The Doctor was taken by surprise, and responded feelingly, expressing his high appreciation of the hearty co-operation of his assistants, without which his administration could not have been the success he believed it had been. He then entered into a few particulars of the conduct of the department during the sixteen months that he had held office, especially calling attention to the prompt and systematic way in which the inspectors had done their duty, so that complaints were not allowed to accumulate, and the files were kept bare. The appropriation of $400,000 allowed for the work of 1890, and which he had been given to understand must cover the expenses, had been made to do so by strict economy, but next year he wanted the council to give $500,000, and more effective work could be done; 325 scavenger wagons were needed where there were only 225 now, and a similar expansion of the service was needed in all branches.

The especial duty which devolved upon the Health Department was to prevent disease, to maintain good health in the community, and to enable it to accomplish this, the people must give money enough to keep the city clean, and the aim should be that when the nations of the earth met here in 1893, Chicago, with a population of 1,200,000, the second city in the United States, should be the cleanest, healthiest city in the world.

So well had the Chicago Health Department become known that he was constantly receiving letters from all over Europe, and even from China, Japan, Australia, and other far-away places, asking information in regard to the way this department was run; not only

letters, but individual agents were sent here from all parts of the world to study our system; for the Health Department of Chicago stood to-day as the greatest and most effective health department in the world.

The day before Christmas the five lady inspectors of the Health Department, Mesdames Byford Leonard, Clara Doolittle, Mary Glennon, Marie Owens and Ida Sullivan, presented Chief Inspector Andrew Young with their photographs handsomely framed. Inspector Young is proud of this branch of his department, and he has reason to be, for they are women of education and refinement, whose especial duty it is to visit places where women and girls are employed, talk with them, and see that proper sanitary arrangements are provided. Being clothed with official authority, they can accomplish work which a man could not do, however competent. This is the only board of female inspectors in the world, and it is needless to say that they are invaluable to the department in its efforts to protect female workers.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chippewa Falls, Wis.: Efforts are being made by the State Board of Supervision to erect a new prison.——Cleveland, Ohio: Plans are to be drawn at once for a new school building. Mr. Beman, of the Board of Education, can furnish particulars.——Chicago, Ill.: 332-334 North Franklin street, a four-story flat building; cost, $22,000. J. H. Moore, architect. Thirty-fifth and Dearborn streets, a three-story stone store and flat building; cost, $6,000. H. D. Deam, architect. Corner of Fulton street and Artesian avenue, four two-story flat buildings; cost, $16,000. D. A. LaPointe, architect. J. C. Brompton is preparing plans for a three-story flat building to be erected on North Clark street; cost, $10,000. Faber & Pagels are making plans for five two-story residences to be erected on Columbia street; cost, $50,000. The same architects are taking bids for a two-story flat building and for a church building to be erected at Dixon, Ill. Adler & Sullivan are preparing plans for a factory to be erected on West Fifteenth street; cost, $35,000. 4356 Berkeley avenue, an apartment building; cost, $20,000. Thomas Wing, architect. Irving avenue, near Van Buren street, a two-story building. Louis Martens, architect. George Maher has plans for a three-story residence to be erected at Kenilworth; cost, $15,000. Corner State and Sixty-first streets, a three-story store and flat building. J. A. Wierzhienec, architect. Corner of Superior and Halsted streets, a five-story factory. Theodore Lawandowski, architect. J. C. Brompton is preparing plans for a two-story flat building to be erected at Ravenswood; cost, $15,000.——Brooklyn, N. Y.: Ralph street, near Evergreen avenue, five three-story frame tenements; cost, $23,500. Frank Holmberg, architect. Myrtle avenue, near Throop avenue, five four-story brick flats; cost, $55,000. Henry Engelhardt, architect. Patrick Keeley has designed the Catholic church of "Our Lady of Victory," corner of McDonough street and Throop avenue, to cost $150,000.——New York City: Eighty-fifth street, near Third avenue, three five-story brick flats and stores; cost, $66,000. Edward Wenz, architects. Fifth avenue and 117th street, three five-story brick flats; cost, $91,000. W. B. Franke, architects. 434 East 121st street, a five-story brick flat; cost, $91,000. W. B. Franke, architect. 118th street, near Eighth avenue, four five-story brick flats; cost, $72,000. Andrew Spence, architect. Edgecomb avenue, near 145th street, three four-story brick and stone flats; cost, $30,000. W. A. O'Hea, architect. 311 West 21st street, a five-story brick flat; cost, $20,000. M. V. B. Ferdon, architect. 60 West 92nd street, a four-story brick dwelling; cost, $22,000. L'Oench & Simon, architects. Eighth avenue, near 117th street, eight five-story brick stores and flats; cost, $169,000. A. B. Ogden & Son, architects. 101st street, near Ninth avenue, a five-story brick flat; cost, $22,000. F. J. Miller, architect. Corner of Madison avenue and 103rd street, four five-story brick and stone flats; cost, $86,000. John. C. Burne, architect. 65th street, near Eighth avenue, two-five-story brick flats; cost, $44,000. George Keister, architect. Corner of Vandom and McDougal streets, two five-story brick tenements; cost, $67,000. Andrew Spence, architect. 98th street, near Ninth avenue, a five-story brick flat; cost, $20,000. Edward Wenz, architect. 137th street, near Willis avenue, a brick church; cost, $47,000. T. Ovington, architect. McKim, Mead & White are preparing plans for the new *Herald* building to be erected at the corner of Sixth avenue and Broadway, and to occupy an entire block. Henry J. Hardenbergh prepared the plans for the Astor hotel to be erected at the corner of Thirty-third street and Fifth avenue. Hilton, Hughes & Denning have plans for a five-story brick stable to be erected at 160 to 168 West Tenth street. Jno. C. Burne has plans for two seven-story apartment houses to be erected on Lenox avenue near 117th street; also four five-story brick flats to be built on 113th street, near Fifth avenue, at a cost of $118,000.——Omaha, Neb.: T. C. Doran, Engineer and Superintendent of the Omaha Union Depot Co., has completed plans for a power house, also a mail and express company building, for the Union Depot Co., to cost $40,000. J. H. W. Hawkins, architect, has completed plans for a brown stone residence for Guy C. Barton, to cost $75,000; also a dwelling for Charles J. Greene, to cost $10,000, and another for Herman Kountz, to cost $65,000. These will be heated by hot water and electricity used. He has also completed plans for Trinity College, to cost $40,000.——Boston, Mass.: Walnut place, three brick dwellings; cost, $20,000. William Holmes, architect. Harrison avenue, corner Stoughton street, a brick dispensary; cost, $75,000. Allen & Kenway, architect.——Braintree, Mass.: Elm street, a frame block; cost, $25,000. Frank Ober, Boston, Mass., architect.——Atlanta, Ga.: A company has been organized to erect a $300,000 opera house in this city.——Minneapolis, Minn.: The Clayton Plow Works will build extensive shops.——Baltimore, Md.: Charles J. Carson is drawing plans for a large office building to be erected on the site of the old Barnum hotel. The cost of building will be $1,000,000.——Michigan City, Ind.: Addition to malt house; cost, $28,000.——Minneapolis, Minn.: It is reported that it will take $100,000 to change various school buildings so that they will be in proper sanitary condition. The matter has been referred to the Building Committee of the Board. B. F. Nelson is chairman.——Canton, Ohio: It is proposed to erect a new hotel at Lake Park. Architect Knapp has the plans.——Harrisburg, Pa.: Corner of Second and Market streets, alterations to the Commonwealth hotel; cost, $25,000. J. C. Smith, architect.——Holyoke, Mass.: A tenement brick block; cost, $20,000.——Johnson City, Tenn.: A $40,000 opera house is to be erected. Eugene Horton can furnish particulars.——Detroit, Mich.: 99-103 Lafayette avenue, a six-story brick and stone temple; cost, $60,000. Masonic order. Corner Woodard and Willis avenues, two-story brick block; cost, $30,000.——Geo. W. Myers, architect.——Minneapolis, Minn.: North-East 31st avenue and Main street, a brick manufacturing building; cost, $125,000. First street and South Fifth avenue, alterations in saw mill; cost, $20,000.——Omaha, Neb.: Henry Voss is preparing plans for a brick and stone hotel; cost, $50,000.——South Evanston, Ill.: R. G. Pentecost, Chicago, has plans for a hotel building to cost $200,000.——West Superior, Minn.: A $60,000 hotel will be erected.——Bridgeport, Conn.: Longstaff & Hurd have drawn plans for an addition to building on corner Main and Golden Hill streets.——Washington, D. C.: The new residence of Senator Sherman, to be erected on K street opposite Franklin Park, will have a front of stone; the cost will be about $70,000. Mr. Fred G. Atkinson is the architect. Architect N. T. Haller has plans for a block of twenty-eight houses that a syndicate will build at the north-east corner of Second and E streets, at a cost of $84,000; they will be two-stories and cellar, with fronts of brick and Ohio stone. The new colored high school, which builder Peter McCartney has begun on M street, just south of New York avenue, will cost nearly $100,000.——Lincoln, Neb.: A new union depot is contemplated. The Rock Island and other companies are interested. Cosgrove & Co., real estate brokers, Lincoln, can give information.——Council Bluffs, Iowa: The Chicago & Northwestern Railway will build a $40,000 depot in the spring.——Newark, N. J.: A sub-committee of the Board of Trade is considering the building of a $500,000 hotel in this city.——Omaha, Neb.: The Omaha Brewing Association is preparing to erect a million dollar brewery. Benjamin Smith has decided to erect a $150,000 office building on Farnan street, near 13th. It will be heated by steam. Electric light and electric elevators will be used. Thomas

Murray will erect a $200,000 office building next spring on Harney street, near 17th.——Waco, Tex.: The Waco Grand Opera House Company has been organized at this place, with a capital stock of $100,000, the purpose being to erect an opera house.——Johnstown, Pa.: A brick tenement; cost, $15,000.——Lancaster, Pa.: Brick gymnasium for Franklin and Marshall college; cost, $10,000. Address W. U. Hensel, chairman committee.——Louisville, Ky.: New Broadway, a brick dwelling; cost, $12,000. —— Marble Falls, Tex,: Cotton factory; cost, $20,000. L. G. Hesser, architect.——Milwaukee, Wis.: Third and Cedar streets, storehouse; cost, $8,000. Vogel & Son, architects.——Reading, Pa.: Fifth street, near Chestnut, three-story stone building; cost, $20,000. L. Focht, architect.——Denver, Col.: I. Hodgson is drawing plans for a $20,000 stone residence to be erected on Pennsylvania avenue, between 8th and 9th avenues. The same architect is preparing plans for a $20,000 residence at the corner of Pennsylvania and 11th avenues. George C. Schleier will build a $50,000 stone residence at Pearl street and 10th avenue. Mayor Londoner will erect a residence on corner 8th and Clarkson; cost, $30,000. Messrs. Andrews & Jacques, architects, are building a $30,000 residence on Logan street, near Tenth. Governor Grant will erect a residence on Pennsylvania street, between 7th and 8th; cost, $75,000. H. W. Michael will erect a dwelling on Pearl street, between 8th and 9th; cost, $30,000. A. C. Dake will erect a building on Logan, between 10th and 11th; cost, $30,000. E. P. Varian will erect a residence of white stone; cost, $20,000; located on Pearl, between 8th and 9th. Judge Hallett has plans for a $40,000 house, which he will soon begin to erect. T. M. Patterson is having plans drawn for a $50,000 residence on Washington, near 7th. It is understood that ex-Governor Elbert has plans ready and will soon begin a $40,000 residence at the corner of Washington and 8th avenues. Mr. H. B. Chamberlain contemplates building a residence at the corner of Washington and 8th, which will cost approximately $100,000. John L. McNeill is having plans prepared for a $40,000 house, to be erected on 8th and Pennsylvania. Messrs. Dennis Sheedy, F. A. Keener and J. K. Mullen contemplate building magnificent houses on Pennsylvania avenue during the coming season.

HEATING AND LIGHTING.

Bement, Ill.: The Bement Electric Light and Power Company is about to expend $10,000 on a plant. W. M. Camp can give details.——Chicago, Ill.: The Chicago Incandescent Light and Wiring Company has been incorporated; capital stock, $10,000. Address L. B. Scott.——De Soto, Mo.: The Consumers' Electric Light and Power Company has been incorporated, and will put in a plant at once.——Lancaster, Pa.: The contract between the company furnishing electric lights and the city will expire Jan. 1, and arrangements are about to be made for public lighting for the year 1891.——Portland, Me.: The Robert Storage Battery Company has been formed, Its purpose is to deal in electrical storage batteries and other electrical appliances. The capital stock is $1,500,000. The officers are Wm. Farwell, Sherbrooke, Joseph W. Symonds, and others.——Newark, Del.: The streets are to be lighted by electricity.——Chicago, Ill.: The city council has granted a franchise to the Chicago Economic Fuel Gas Company, which will furnish gas for 60 cents per 1,000 feet for illuminating, and 50 cents for fuel gas.—— Omaha, Neb.: J. H. W. Hawkins is the architect for several large buildings which will be heated by hot water.——Charleston, West Va.: M. B. Reber, J. C. Neal and others have incorporated the New York and Ohio Company, for the purpose of manufacturing machinery, electrical supplies, etc. ——Lampasas, Tex.: A stock company has been formed at Lampasas, to erect an electric light plant.——Harrisonburg, Va.: The Harrisonburg Electric Light Company has been organized, with J. P. Houck, president, and E. S. Conrad, secretary, to erect an electric light plant.——Columbia, Mo.: The city will issue $45,000 worth of bonds to provide itself with a water and electric light plant.——Nashville, Tenn.: The Maplewood Suburban Home Company will erect an electric light and power plant.——Salisbury, N. C.: The erection of an electric light plant is talked of at Salisbury. The Mayor can give information.——Big Stone Gap, Va.: E. T. Short & Co. want a 15 or 20 horse-power boiler and engine.——Weatherford, Tex.: R. W. Kindel wants two 450 to 500-light incandescent dynamos, and a 40-light arc dynamo.——Della, Md.: A. Zeitinger & Son want electric lighting machinery and motors.——Brookston, Tex.: M. G. Bean wants a 40-horse-power engine and a 60-horse-power boiler.——Front Royal, Va.: The Maryland Tack and Wire Nail Company, E. V. Cordell, president, will purchase a boiler and engine. The company will also purchase an electric light plant.——Little Rock, Ark.: The city electric light plant will be enlarged.——Chicago, Ill.: The Auburn Park Electric Light, Power, Heat and Railway Company has been organized here; capital stock, $30,000. Address W. E. W. Johnson.——Sioux Falls, Dak.: Extensive improvements are to be made to the local electric light plant.—— Quincy, Mass.: Improvements are to be made to the electric lighting plant.——Malden, Mass.: Improvements are to be made in the local electric light plant.——McKeesport, Pa.: An additional electric light plant is to be established.——Sellarsville, Pa.: It is proposed to establish an electric light plant.——Port Angeles, Wash.: This place is to have electric lights and gas works. Address C. R. Mallett, Victoria, for particulars.——Warren, Ind.: The pipes of the Huntington Gas Company are to be extended to this place.——Ayer, Conn.: The Ayer Electric Company, B. H. Hartwell, president, intends taking immediate steps toward putting in a system, to comprise Ayer, Shirley and Groton.——Waverly, N. Y.: Improvements are to be made in the electric light plant.——Plainfield, N. J.: The Plainfield Gas and Electric Light Company has filed articles of incorporation. The company begins business with a capital of $175,000. Its president is Postmaster Elias R. Pope, of Plainfield. ——Mount Pleasant, S. C.: A bill now before the South Carolina Legislature, chartering the Mount Pleasant and Seaview Railroad Company, authorizes the company to operate an electric light and power plant.——Roanoke, Va.: The city will hold an election to decide as to the issuance of $12,000 for electric lights and $5,000 for an electric fire-alarm system.——Wilmington, N. C.: L. N. Cox, of Washington, D. C., has purchased the water-works of the Clarendon Water-Works Company at Wilmington, N. C., and is to enlarge same; also is to erect an electric light plant.——Brenham, Tex.: A. & H. Harrison want to correspond with manufacturers of storage batteries.

SEWERAGE NOTES.

Woburn, Mass.: The drainage question is exciting much attention.——Northampton, Mass.: The Legislature will be asked to pass an act allowing the city sewer commissioners to borrow money for sewers, up to the amount of $250,000.——Phœnix, Ariz.: An elaborate report on the sewerage system has been presented by Councilman Barry and the city engineer, Breakenridge.——Savannah, Ga.: The following resolution was adopted in council, December 8: "*Resolved*, That Alderman Falligant be and is hereby requested to submit to this board a plan for house-drainage at as early a day as practicable, said plan to be based upon the surveys made by Mr. Hering, and to be accompanied by estimates of the cost of the work, and recommendations for the accomplishment of the same."—— San Rafael, Cal.: Engineer Schussler, of the Spring Valley Water Company, has submitted to the town trustees a plan for conveying the sewage of the town to deep water. The plan was considered feasible, and was taken under advisement by the board.——Rochester, N. Y.: Samuel W. Gray, of Providence, R. I., will, by direction of the Rochester city council, report upon the plan of Emil Kuichling for the disposal of sewage of the East Side of the city.——New Orleans, La.: The Board of Commissioners of the Orleans Levee District made application to the New Orleans city conncil for assistance in its work to the extent of the purchase of some improved machinery for the drainage of the city.——Pawtucket, R. I.: The Newell avenue sewer is to be built to forward the construction of the outfall sewers in the Moshassuck river district. An ordinance has been adopted establishing a general-construction account for sewers.——Newton, Mass.: Plans and a report on the proposed sewerage system have been prepared by Mr. A. F. Noyes, city engineer.——Syracuse, N. Y.: The Health Commissioners have appointed a committee to report upon the improvement of the sewerage of the Fifth Ward.——Roanoke, Va.: City Engineer Dunlap has suggested that whatever sewers are laid should be augmented by the adoption of the dry-earth closet system.——Knoxville, Tenn.: Resolutions have been adopted to apply to the Legislature for power to issue bonds for $25,000 for sewers.——Savannah, Ga.: Alderman

Falligant has submitted to the Board a plan for house-drainage, based upon the surveys made by Mr. Hering.——Richmond, Ind.: Plans are being prepared for a trunk sewer 6,600 feet long, to drain a district of one square mile. Work will probably be commenced next season. Mr. W. H. Stucky is city engineer.——South Chicago, Ill.: A citizens' committee has been organized to consider the question of sewerage and paving.——Minneapolis, Minn.: Mr. Van Duzee, engineer in charge of sewers, says that about 18 miles of sewer will be built next season.——Calgary, N. W. T.: Plans for the sewerage of a portion of Calgary have been prepared by Mr. Wm. Kennedy, Jr.——Macon, Ga.: A bill has been introduced in the Georgia Legislature authorizing Macon to issue $210,000 of bonds for drainage and sewerage.——Cordele, Ga.: The city has voted to issue $14,000 of bonds for a sewerage system.——Waltham, Mass.: The Board of Aldermen has appropriated $299,000 for a sewerage system. The city is about to adopt plans for the system that will cover 35 miles of streets, and will require an outlay of more than $300,000. The chairman of the Board of Sewer Commissioners is E. T. Luce, Esq., Waltham, Mass.——Gordonsville, Va.: Bids for 500 feet of 18-inch sewer-pipe will be received by T. W. Ross.——Boston, Mass.: City Engineer Jackson has rejected the bids for the construction of section 10, interception sewer of the improved sewerage system of Dorchester, there being too great a difference between the lowest and the next highest bid.——Knoxville, Tenn.: The project to appropriate the sum of $125,000 for additional sewers has been indorsed by a public meeting of citizens.——Tiffin, O.: It is proposed to establish additional sewers. President Love, of the city council, can furnish particulars.

WATER-WORKS NOTES.

McGregor, Tex.: The proposed water-works for this place will soon be established.——Piedmont, W. Va.: The question of establishing a system of water-works will soon be put to a popular vote of the people.——Fort Valley, Ga.: A bill has been introduced in the legislature to authorize this city to issue bonds for the construction of water-works.——Norfolk, Va.: Additional improvements are to be made to the local water-works plant. Address the mayor for particulars.——Milwaukee, Wis.: The Common Council Committee on water-works will recommend that $3,000 worth of water meters be purchased.——River Forest, Ill.: The ordinance to establish the water-works in this village is still in Committee of the Whole of the Board of Trustees.——Fort Douglas, Utah: George W. Field, Omaha, Neb., has completed plans for a system of water-works here, to cost $62,636.——Staunton, Va.: Improvements are to be made to the city water-works.——Watauga, Tenn.: The Watauga Water Company is constructing a system of water-works.——Meridian, Tex.: The construction of systems of water-works is projected at LaGrange and Meridian.——Marion, N. C.: D. K. Hitchcock wants to correspond with water-works contractors.——Yoakum, Tex.: E. P. Kelley, Alexander Fay and J. Blanks have incorporated the Yoakum Water Power Company; capital, $60,000.——Quincy, Mass.: A water supply system will be constructed at Quincy, to cost $423,000. The plan embraces an impounding reservoir to be located on the eastern slope of the Blue hill range, which will yield at least 5,000,000 gallons daily, or a reservoir on Pine hill supplied from a pumping station, to contain 2,000,000 gallons. An auxiliary reservoir at Wollaston, with a capacity of 500,000 gallons is contemplated. Thirty-seven miles of pipe with 276 fire hydrants will be laid.——McGregor, Tex.: The McGregor Artesian Water Company will want a stand-pipe.——Dublin, Tex.: The Dublin Water-Works Company wants a stand-pipe.——Brunswick, Md.: The Brunswick Water Company, C. M. Wenner, president, will want a complete outfit, machinery, etc., for water-works.——Vicksburg, Miss.: The Vicksburg Water Supply Company is to extend its works.——Antoinette, Col.: Water-works bonds have been issued, and will be sold January 2, 1891, to the amount of $6,000. Water will be supplied by 1½ mile of pipe from tank on 60 foot tower.——Avoca, Iowa: Bonds to the amount of $10,000 have been voted for water-works' the work to be commenced in the spring. The plans and specifications are now being drawn by Mr. F. L. Burrell, engineer, whose address is Fremont, Neb. Said plans, etc., to be ready on January 1st. The town council will advertise for bids about February 1st.——Knoxville, Tenn.: The Tillery Springs Water Company has secured the contract to furnish a supply of water to West Knoxville. Mr. Sturtevant, the company's engineer, can furnish particulars.——Butte City. Mont.: The water-works question is to be decided at an early meeting of the city council. The city clerk can furnish particulars.——Winter Harbor, Me.: It is proposed to build a system of water-works to supply residents on Grindstone Point. Water will be taken from Birch Pond.——Terryville, Conn.: This place is to have a complete system of water-works.——Pelham Heights, N. Y.: It is proposed to establish a system of water-works.——Auburn, Me.: A committee of the city council has been appointed to inquire into the feasibility of the city either purchasing the present water-works system or establishing a separate one of its own. Particulars can be obtained by addressing Alderman McCann.——Oakland, Neb.: The city has voted bonds, and as soon as same are disposed of, it will receive bids, etc.——Jackson, Mich.: Extensive improvements are to be made to the local water-works plant.——Salem, Ore.: The Salem Water Company is about to construct an additional reservoir to supply the growing needs of the town. It will have a capacity of 2,000,000 gallons and will cost $50,000.——Columbia, Mo.: The taxpayers of this city have voted the sum of $45,000 to establish a combined electric light and water plant.——Jacksonville, Fla.: C. R. Braine, of Brooklyn, N. Y.; G. A. Everett, of Orlando; J. D. Ray, of New York, and others have incorporated the Florida Town and Improvement Company of Jacksonville, Fla., authorized to deal in land, construct water-works, etc. The capital stock is $500,000.

BIDS AND CONTRACTS.

Fairfield, Ia.: Bids are open until Jan 5th, for a fire proof building to cost $60,000. Address the Board of Supervisors for information.——Troy, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock, P. M., on the 13th day of January, 1891, for all the labor and materials required to put in place complete the cast iron columns in basement, the stands for the first story columns, and the iron beams, girders, etc., for the first floor of the U. S. Post Office, Court House, etc., building, at Troy, N. Y., in accordance with the drawings and specifications, copies of which may be had on application at this office, or the office of the Superintendent at Troy, N. Y. Jas. H. Windrim, Supervising Architect.——Denver, Colorado: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 15th day of January, 1891, for all the labor and materials required for the plumbing, gas-piping, etc., for the United States court-house, post-office, etc., building at Denver, Colorado, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Denver, Colorado. Jas. H. Windrim, Supervising Architect.——Scranton, Pa.: Sealed proposals will be received at the Office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 7th day of January, 1891, for the iron beams, etc., for first floor, basement, columns, etc., for the U. S. Post-office, etc., building at Scranton, Pa., in accordance with drawing and specification, copies of which may be had on application at this office or the office of the Superintendent, at Scranton, Pa. Jas. H. Windrim, Supervising Architect.——Bombay, India: Proposals are wanted until February 16th for an experimental street-lighting plant. Address E. W. & R. Oliver, Corbet Court, London, England.——Fort Reno, O. T.: Sealed proposals, in triplicate, subject to the usual conditions, will be received at the office of the post quartermaster at Fort Reno, O. T., until 12 o'clock noon, central standard time, Friday, Jan. 9, 1891, and then opened in the presence of bidders, for furnishing material and labor required in the erection and completion of one building for a cavalry stable at Fort Reno, O. T. C. W. Foster, Quartermaster, U. S. Army, Chief Quartermaster.——Washington, D. C.: Sealed proposals, indorsed "Proposals for Officers' Quarters at Washington," will be received until 12 o'clock noon, on Tuesday, Jan. 6, 1891, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be forwarded upon application to the commandant of the navy yard, Washington, D. C. N. H. Farquhar, Chief of Bureau.——Lowell, Mass.: Proposals, indorsed

"Proposals for Pumping Engine," will be received at the office of the Lowell water-works, City Hall, until Jan. 16, for the construction, delivery and erection of a 10,000,000 gallon steam pumping engine for the city of Lowell. Other information may be obtained upon application to Lowell Water Works Office, or from George H. Barrus, M. E., 95 Milk St., Boston, Mass.——Brooklyn, N. Y.: The mayor opens bids Jan. 14: First, for the amount of the cost of the construction of the whole armory, including mason work and works, carpenter work and work, steam heating work and works, plumbing work and works, contained in the respective specifications; second, for the mason work and works contained in the mason's specifications for the construction of the Thirteenth Regiment armory; also for the carpenter work and works contained in the carpenter spccification for the construction of the Thirteenth Regiment armory; also, for the iron work and works contained in the iron specification for the construction of the Thirteenth Regiment armory; also, for the steam heating work and works contained in the steam heating specification for the construction of the Thirteenth Regiment armory; also, for the plumbiog work and works contained in the plumbing specification for the construction of the Thirteenth Regiment armory. Plans may be seen at the department of parks, city hall, and the office of the county clerk, hall of records. Specification may be obtained and forms of proposals can be procured on application to the secretary of the mayor's office.——Cincinnati, O.: Sealed proposals will be received at the office of the Board of City Affairs until 12 o'clock noon on Wednesday, January 14, A. D. 1891, for one and two horizontal pumping engines, as follows: For one compound condensing engine having a capacity of six million gallons, in twenty-four hours, with a steam pressure of 110 pounds and a water pressure of 145 pounds. This engine to be delivered as a perfect low duty, but so arranged as hereafter to be made by additions to show a duty of one hundred million foot-pounds. Bidders will state in their proposals the cost of this engine delivered and erected in Cincinnati, O,. as also the additional cost of the proposed additions for full duty, if ordered within twelve months of the date of this contract. Proposals will also name the cost of one additional engine of same size and full high duty, with the right to order same within one year from date of contracting for the first engine. Bidders will furnish full drawings and specifications with their proposals and also state their guarantee as to time of delivery and duty to be shown by test. Information will be furnished by Willis P. Tharp, Superintendent and Engineer Cincinnati water-works. Thomas G. Smith, President Board of City Affairs.——Denver, Col.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 6th day of January, 1891, for all the labor and materials required, and fixing in place, complete, all the iron furring, lathing and plastering, ceiling light, etc., required for the U. S. court house, post-office, etc., building at Denver, Col., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Denver, Col. Jas. H. Windrim, Supervising Architect.

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HOLIDAY RATES.

WABASH AND NIAGARA FALLS SHORT LINE.

For the Holidays the Wabash Railroad will sell tickets to all local stations on the system, and to Niagara Falls, Buffalo and Canadian points, at a fare and one-third for the round trip, on December 24, 25, 29 and January 1. The returning limit on tickets to Detroit and all other local stations will be January 5; from Buffalo, Niagara Falls and Canadian points, the returning limit will be January 3.

HOLIDAY EXCURSION RATES.

The Chicago & Grand Trunk Railway, Cincinnati, Saginaw & Mackinaw R. R., and the Michigan Air Line and Detroit Division G. T. Ry. have arranged to sell special holiday excursion tickets at one and one-third fare between stations on their lines and also o points on Detroit, Grand Haven & Milwaukee Ry., and Toledo, Saginaw & Muskegon Ry., under the following arrangement:

Christmas tickets will be on sale from December 24th to December 25th, inclusive, and good to return up to and including Jan. 3rd, 1891.

New Year's tickets will be on sale from December 31st, 1890, to Jan. 1st, 1891, inclusive, and good to return up to and including Jan. 3rd, 1891.

Special return tickets to all Canadian points west of and including Toronto, Niagara Falls and Buffalo, will be sold on the above dates and limits at one and one-third fare from all stations on the above lines.

BURLINGTON ROUTE—BUT ONE NIGHT TO DENVER.

"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

In Italy a new metallurgical branch is to be started in the erection, by a French firm of manufacturers, of a factory for the production of machine-made nails.

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LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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THE SANITARY NEWS does not care a straw what party is in the ascendency in the Drainage Commission. It is a matter of indifference to it whether they all be republicans or all democrats; but, as all good citizens must, it protests against making partisan politics a feature, however small, of the board. The interests involved are entirely too vast to allow them to become overshadowed by anything else. The scheme for a canal contemplated in the early discussion of this question serves too well the sanitary and commercial interests of this section of country to be abandoned. The opportunity to serve these two great interests should not be lost in a petty squabble for political preferment.

PHYSICIANS in some of the New York hospitals announce indications of the cure of some forms of cancer by the use of Prof. Koch's lymph.

WITH the discoveries of Prof. Koch and Dr. Shurly, Dr. Brown-Sequard seems to be lost sight of.

THE veterinary society of Paris has made an application to the municipal authorities for subvention to assist in making experiments with the Koch remedy on tuberculous cattle.

SECRETARY RUSK has published an order designed to protect the live stock of this country from imported infectious diseases. He has issued an order closing all the ports except St. Albans in the collection district of Vermont against the importation of cattle, sheep, and other ruminants and swine, and requiring that all such animals imported through this collection district must enter at the port of St. Albans, where they must be inspected by a veterinary inspector of the Department of Agriculture. Railroad companies carrying animals imported into the United States are required to provide the necessary pens and to unload such animals so that they may be properly inspected. The secretary says this is done as a protection against the introduction into this country from Canada of any contagious disease affecting these classes of animals. Such inspection is provided for by the act of Aug. 30, 1890; and in view of the fact that the English veterinary authorities at Dundee, Scotland, have only recently seized Canadian cattle when landed there, declaring them to be affected with contagious pleuro-pneumonia, Secretary Rusk feels it incumbent upon him to take all measures necessary for its rigid enforcement. Moreover, England has prohibited the importation into that country of sheep from the United States on the ground that the government has not heretofore caused to be made an inspection or quarantine of sheep arriving here from other parts of the world.

COMPLIMENTARY TO CHICAGO PLUMBERS.

THE SANITARY NEWS has often called attention to the progressive character, the straight-forward business and intellectual work of the Chicago Master Plumbers' Association. This association, like the Health Department of Chicago, has attained a wide reputation and is esteemed and honored wherever known In confirmation of what we have said, and because it is good reading for plumbers, we take the privilege and pleasure of reproducing the following from our honest old friend, the New York *Sanitary Plumber:*

"We never peruse the accounts of the proceedings of the Chicago Master Plumbers' Association in the columns of our esteemed contemporary *Sanitary News*, but what we find ourselves instituting comparisons that are the reverse of complimentary, between the operations of that admirable association and the results accomplished by other societies enjoying similar opportunities, but lacking the power to make use of them. There is hardly a meeting of this organization that does not present some tangible and useful accomplishment. Now it is a discussion on some important technical point or business question affecting the trade; now it is a lecture to apprentices or journeymen, an exchange of views with architects, sanitarians or health authorities, or even a purely social session in which the members enjoy the best opportunities for cementing the friendship and cultivating the good feeling that passes, after all, for something in business relations.

Even the ladies are drawn into the spirit of the work, and we find the social features of the organization promoted and encouraged by the efforts of the Ladies' Auxilliary Society, an association having a substantial balance in its treasury and composed of the wives and other relatives of the Chicago master plumbers.

We published in our last issue an address from one of the prominent members of this organization, forwarded in his capacity of State Vice-President of the National Association to the trade in Illinois, and admirably applicable to plumbers throughout the entire country. It embodies the spirit and sentiments that have made the Chicago Association of Master Plumbers what it is to-day, a spirit which, if properly carried out, would bring other organizations throughout the country up to a similarly high standard of efficiency, without the adoption of star chamber methods or the resort to any alliances that entail the slightest possibility of future complications.

The results of the perfect organization of Chicago's plumbers is readily apparent in the history of the city's growth and progress within the past few years. The plumbers of Chicago are regarded as the most important factors in the preservation of the city's

health. Every ordinance they have advocated as essential to proper sanitation has been adopted; one of their number has been placed in supreme charge of the health of the great city, and is doing wonders to gain for himself and his colleagues the respect and gratitude of the entire population; and even the courts, as the results of several recent trials of careless, incompetent or defiant plumbers have shown, are prepared to uphold the ordinances and regulations that the trade at large have advocated or approved.

In the face of results of such importance to the city's welfare, the minor benefits of a strictly industrial character enjoyed by members of the association shrink into insignificance. But it is no small matter for the plumbers of the western metropolis to enjoy strictly honest and impartial protection at the hands of all dealers in materials and supplies, and, by reason of their unanimity of purpose and loyalty to each other, comparative immunity from labor troubles.

Several of the smaller cities throughout the country possess associations proportionately as efficient and as beneficial to their members as that of Chicago; others are on the high road to this very desirable consummation, but New York has failed to grasp the situation. Members of her association freely admit its lack of power and enterprise, and attribute the fact to various causes; to the want of proper licensing legislation in the metropolis, to the immense number of small and comparatively irresponsible tradesmen who would hardly join any organization, and whom it would be difficult to hold to strict accountability if they did; to the near proximity of other cities having neither associations, sanitary ordinances nor anything else, etc., etc. Chicago and the other cities we might mention labored under similar disadvantages in starting, but overcame them by concerted action and earnest work. Surely New York could do the same.

The foundation material for a first-class organization in the Empire City is not lacking; there are plenty of men as willing to contribute financially and to devote their time to the promotion of the welfare of such an association as there are in Chicago, but their efforts, without systematic direction and set purpose, can accomplish nothing. They are in need of a Moses—or one or two such leaders—who can gather them together and lead them out of the present wilderness of apathy, jealousy, rivalry, and other adverse influences, into the promised land of perfect organization, that is the very life of such an interest as the plumbing trade.

NOTES AND NEWS.

Add two tablespoonfuls of kerosene to the pail of water with which you wash grained or other varnished furniture.

A physician in Rome recently brought to light some interesting specimens of ancient dentistry and artificial teeth in skulls from different Etruscan tombs, dating as far back as the sixth century before Christ.

At Port Huron, it is said there is a scheme to cut a third tunnel under the St. Clair river to Sarnia, to be used by street-cars, foot-passengers and wagons. The Grand Trunk will begin work on their second tunnel soon.

To prevent the snapping and cracking of radiators when the steam is turned on, the valves being open, it is only necessary to cause the steam to enter slowly, giving the water a chance to escape, and the radiator time to warm up.

After three years of experimenting, paper barrels are now being made by an English firm which compete successfully with those made of wood. Waste-paper, cardboard and old sacks are the raw materials for their manufacture.

Prof. Dewar has accidentally discovered that copper, heated to the temperature of boiling water, exerts a destructive effect upon India rubber if the two come in contact. By experiments he determined that the copper oxidized the rubber. This is important information for many.

As long as the cause of a disease is undetected, medicine is groping in the dark, and it is only since the genesis of many disorders has been traced to micro-organisms that an ultimate attainment of the right treatment for them has become probable.—*New York Ledger.*

The Legislature of Vermont has passed an act prohibiting the manufacture of "any article in imitation or semblance of natural butter or cheese," unless it is colored pink. The same restriction applies to imitations used at hotels or other public eating-houses.

A prize worth winning has been offered by the East Indian government. The prize is $25,000 for a practical machine for decorticating ramie. Here is a chance for some of our wide-awake American inventors to show their ability, and at the same time win a little pocket-money.

The Medical Bulletin says that in some hospitals in Europe it is customary to allow visitors to converse on certain days, by means of telephone in a waiting-room, with patients in the wards; and this arrangement has been found to work admirably, as it not infrequently happens that the nervous state of the patient or the possibility of infection by the visitor renders closer communication inadvisable.

Charcoal wafer biscuits, as articles of food, are not, from the nature of the active ingredient which they contain, very attractive in appearance, but they possess a flavor b y no means unpleasant. Indeed, it would be difficult to say from the taste alone that they contained charcoal at all. There is, too, no objectionable feeling of grittiness experienced during mastication. They are adapted for use in cases of excesssve acidity of the stomach.—*London Lancet.*

According to *El Siglo Medico*, the Egyptian government will soon institute a system of compulsory vaccination. The law says that all children must be vaccinated before they have reached the age of three months, this being done at the expense of the state in the case of the poorer classes. Violations of the law are punishable by a fine and imprisonment.

At a meeting of the Society of Chemical Industry held on Nov. 7, Mr. J. Carter Bell, the county analyst for Cheshire, described some experiments he had made on filtering the samples of water from the Irwell, Irk and Medlock, through "polarite." Though the rivers named are three of thefoulest in the country, the water after filtration was found to be comparatively pure.—*Engineering*, London.

An employee of an electric light company was injured while in the performance of his duty. He was engaged in trimming lamps upon a circuit which, under the rules of the company, should have been dead at the time he was working upon it. As a matter of fact it had come in contact, at a point where the insulation was weak, with a live circuit, and had become charged. It would unquestionably have been negligent for a company to turn a current of electricity into the circuit on which he was at work without notifying him of the fact, and it was equally negligent to permit the circuit to become charged by failing to exercise proper precautions as to the crossing of wires and the insulation; and whether the company or its officers actually knew of such defect or not, the company is bound by the effect of its own neglect, and is liable in damages to a workman so injured. This decision was rendered in the case of Kraatz vs. Brush Electric Light Co., in the Supreme Court of Michigan.

Do you rizzle every day? Do you know how to rizzle? One of the swell doctors in town says that it is the most wonderful aid to perfect health. "I masticate my food very thoroughly at dinner," he says, "and make sure to have my family or friends entertain me with bright talk and plenty of fun. After dinner it is understood that I am going to rizzle. How do I do it? I retire to my study, and having darkened the room, light a cigar, sit down, and perform the operation. How to describe it I don't know, but it is a condition as nearly like sleep as sleep is like death. It consists in doing absolutely nothing. I close my eyes, and try to stop all action of the brain. I think of nothing. It only takes a little practice to be able to absolutely stifle the brain. In that delightful condition I remain at least ten minutes, sometimes twenty. That is the condition most healthful to digestion, and it is that which accounts for the habit animals have of sleeping after eating. I would rather miss a fat fee than that ten minutes' razzle every day."—*Chatter.*

Dingler's Polytechn Journal publishes a description of some new apparatus for measuring and regulating the moisture of the air in workshops. In Dr. Rohrbeck's hygroscope an organic

membrane contracts or expands according to the quantity of humidity contained in the air, that movement is transferred to a metal hand, which closes an electric contact arrangement when the moisture exceeds a certain amount, and thereby the water evaporation chamber is closed, and remains so until the dryness of the atmosphere contracts the membrane so much that the metal head, on its movement in the opposite direction, electrically causes the reopening of the chamber. C. Admiraal, of Ryp, Holland, employs for his hygrometer a strip of organic matter soaked in a hygroscopic substance and kept in tension by means of a spring. The movement of the strip is transferred, through a tooth segment and wheelwork, to a rod with an ink device at its end. The changing length of the strip is thus recorded on a cylinder revolved by clockwork.

We are all, doubtless, familiar with the common belief of people in the poisonous properties of the finger nail. We have, indeed, ourselves seen some severe inflammations caused by the scratch of a nail. So general a belief must, according to Herbert Spencer, have something of truth, and modern bacteriology has furnished the demonstration. It is not the nail *per se*, of course, that poisons, but something that is on or under the nail. Seventy-eight examinations were recently made in Vienna (says the *British American Journal*) of the subungual spaces, and there were found: of micrococci, 36 kinds; of bacilli, 18 kinds; of sarcinæ, 3 kinds, and common mould spores were very often present.

Personal cleanliness should be insisted on in everybody, but how necessary is it for the surgeon. Antiseptics can never and will never successfully take the place of soap and water and the scrubbing brush, but as additions to this process they must, in the light of the demonstrations before us, be henceforth forever included in the routine practice of the conscientious surgeon. The habitually clean will, of course, have less trouble in the preparation of the hands, but the necessity for attention to details in the cleaning of the hands and nails has now been made plain by the valuable experiments of Furbringer, confirmed by many others and the practice of surgeons like Billroth, who now adopts the suggestions of these investigations in his operative work.—*New Orleans Medical and Surgical Journal.*

TECHNICAL EDUCATION OF ARCHITECTS.*

Having now indulged in some criticism, let me turn to the more pleasant task of pointing out that this curriculum is in many ways an admirable statement of the subjects which students ought to become familiar with; that it has arranged them very intelligently, and stated them with much clearness, and that it forms a very good statement of what may be definitely included under technical education for architects. I need not add that it must be supplemented by practical education. It is in its very nature a programme drawn up for the use of students who are every day and all day long practically engaged in professional work, and to such men, if they are resolute enough and in the enjoyment of sufficient vigor and sufficiently good health, to work with a will through the number of hours devoted to study, it offers many advantages.

Of course, the actual success of this or any effort depends mainly on personal considerations — the resolution and abilities of the students; the aptitude and attainments of the teachers; and I know that those who drew out this scheme have not been unmindful of the fact that young men have only a certain amount of learning power left after a day's work — properly done, and of that other fact that men of cultivation who are apt to teach and willing to accept what must necessarily be a modest remuneration for teaching are not very easy to find. One other sort of person will, I think, also be required, though no hint of him or his office is included in the report, and that is a kind of general superintending and advising head, who shall be able to give counsel, direction, sympathy and encouragement to all the students and to all the instructors.

With very sincere good wishes for the prosperity of this new departure at the Architectural Association when it actually, after due discussion, gets into working trim, I pass on to consider what those can do who are rather differently circumstanced.

In a very considerable number of cases the men who propose to become architects are in sufficiently easy circumstances, or are fortunate in having friends able and willing to allow them sufficient time and to do for them whatever may be best to procure them an education that will fit them for the higher walks of their proposed career; and incidentally for passing the examinations, with a notice of which this paper opened. Such men, coming either from a good school or from college, are particularly well prepared to benefit by work in a collegiate institution like the one within whose walls we are met; and if they can have one session, or in some cases two, at University College, London, and can occupy their time in receiving technical education here, they will no doubt be far better fitted for taking advantage of the professional training that will follow than they could otherwise be.

We know the subjects. Let us see how a man with a year to devote to them might here take them up. Generally, I should like to say, the student in any class which he attends here will find the professors to be men who have been carefully selected as men of high standing and reputation, well acquainted with their subjects, in many cases highly distinguished in them, and in not a few cases, also, their fellow-students will be the men from among whom the eminent practical workers of the next generation will rise, men who come here from institutions where they have had an excellent preliminary training; bringing with them habits of study and good elementary information, and whom it is a great advantage to have as fellow-students. Nor are the fine library and the general organization of the whole place for purposes of study to be overlooked. They form, in fact, elements of great value in estimating the use of such a college as this to the students who frequent it.

The subjects which students with a year at their disposal ought to take up will vary with the progress they have already made, but elementary mathematics and applied mathematics and mechanics (especially the graphical methods of calculation), will in almost every case be subjects which should be carried further than ordinary teaching takes them, and the junior course in each of these subjects, as conducted by Professor Hill and Professor Karl Pearson should, generally speaking, be attended, including in this Professor Pearson's drawing class. I have very little doubt, however, that in not a few cases the student may come so modestly equipped with mathematical training, that the lower junior class — which takes up arithmetic, algebra and geometry, and covers the subjects of the Matriculation Examination of the University of London — will be the one which they should attend. These would cover mensuration.

Elementary physics are the subject of a separate course which Dr. Fion takes; and land surveying and leveling form the subject of a course of practical instruction given by Professor Vernon Harcourt. This amount of instruction would supply the mathematical knowledge required for passing either of the examinations, and desirable in actual practice.

Sanitary science, a subject essential for practice and for examination, is taught here by Dr. Corfield, the Professor of Hygiene, a man who deservedly holds a high position as an authority on this subject. It is manifestly wrong that a man whose profession it is to design and erect houses, schools, hospitals and all other sorts of places where men and women are to reside and work, should be in any respect deficient in acquaintance with the laws of health, and the plans to be followed and the precautions to be observed in rendering buildings safe and salubrious, and in correcting defects in old buildings. The very existence of the distinct profession of a sanitary engineer is something of a reproach to the architectural profession.

Elementary chemistry and geology are subjects intimately connected with the architect's work, and for the study of which in this college provision is well made. These are not set down as examination subjects at the Institute, but they are most desirable to know, and, of course, whenever the honors examination is instituted, they will form some, at any rate, of the subjects of examination.

We now approach a group of subjects where the instruction received in any college cannot of itself suffice, but must be supplemented by practical experience, but where the technical study for the most part forms the subject of the work of Class B for the study of construction, which I conduct. In that class all

* *Architecture and Building.* Continued from page 66, Vol. XVII.

the more important building materials, such as wood, stone, slate, marble, brick, terra-cotta, lime, cement and iron are taken up in succession, their strength, weight, durability and other properties described, and the defects and excellences of bad and good specimens are pointed out, and the part they play in building construction is explained. The general principles of construction, trussing, walling, arching, vaults, domes, and so on, are also taken up in succession, and are passed in review, and thus the whole of the subjects named in that part of the programme for the examinations which deals with materials and construction are in turn dealt with. No examination papers have been yet published to show exactly what the scope of the intermediate examination is to be, but, judging from the published programme, it appears to me that a student going through this course, and doing a proper amount of preparation work at home, ought to be well able to pass that part of that examination, and the lectures will be adapted to secure that aim. No academic course alone is to be relied on to impart that practical knowledge of instruction which the final examination requires, but the course here will suffice if supplemented by home work, and by diligent use of the opportunities which are enjoyed during three or four years in an office, with access to works in progress, to prepare the student for passing that examination, so far as the building subjects go.

At the same time that I give this statement of the work of one construction class, I am bound to add that it is impossible in a single course of lectures, and difficult for a single professor, to pursue the study of all the numerous, and very various known building materials as far as it is desirable, in some cases at least, to push it. Accordingly, that part of the course of engineering and mechanical technology can, with advantage, be taken by architectural students, in which the manufacture of iron and steel, and the strength of materials and structures, forms the subject; and also that part of the course of chemical technology which covers the technology of building materials. I have already alluded to geology, but ought to add here that those students who are acquainted with that science in its main outlines will yet do well to take the course of lectures on economic geology, for the sake of the information they will afford on the geology of building stones.

BACTERIA IN DRINKING-WATER.

Dr. W. Migula (*Centrablatt. f. Bakt. und Parasitenk.*, bd. viii, No. 12, September 12, 1890, p. 353) makes a contribution to our knowledge of this subject which is really a new departure as regards the examination of drinking-water. He points out that, although considerable stress has been laid on the examination of water for pathogenic organisms, there is no reliable rule to guide the hygienist in his examinations for the ordinary saprophytic organisms and their relation to the purity of water to be used for drinking purposes.

Dr. Migula washes out small flasks with bichloride of mercury; then, after rinsing them with the water to be examined, he leaves a specimen in the flask, which is plugged with sterilized cotton wadding and covered with an India-rubber cap. It is not necessary to pack the flasks in ice, as it is assumed that if any of the organisms multiply, they will all do so, whilst if the putrefactive organisms (those that liquefy gelatin) grow more rapidly than the others, independent evidence is obtained of the impurity of the water. Cultivations are made in flat glass dishes, in order to save the time required in manipulating plates and tubes during the cooling process.

After examining 400 springs, wells and streams, the author has come to the conclusion that when there are more than ten species in any sample of water, especially when these are not species ordinarily met with, the water should not be used for drinking purposes. He found that only in 59 waters was this the case, but that 169 waters contained more than 1.000 organisms per cubic centimeter, 66 of these having over 10,000; 40 over 50,000.

From these figures it will be seen that some of the sources of supply would be condemned by the old method, but would be passed by the new, and some condemned by the new would be passed by the old.

Migula found in all 28 species, and in a series of tables he brings out the fact that the number of colonies does not by any means correspond with the number of species, though in some cases it undoubtedly does so. This is, in fact, an exceedingly variable quantity. It also comes out that putrefactive bacteria are almost invariably absent in spring-water; that they are most frequently found where the number of species is great, and where the number of colonies is between 1,000 and 10,000 per cubic centimeter; that they also occur where the number of germs is below 50 per cubic centimeter, but very seldom when the number is over 10,000.

Dr. L. Schmelk, who recently (*Centralblatt f. Bakt. und Parasitenk*, bd. iv, No. 8, 1888, p. 195) pointed out that there is a great increase in the number of bacteria in the water-supply of Christiania during the period that the upland snows are melting most actively, now (*Centralblatt f. Bakt. und Parasitenk*, bd. viii, No. 4, July 18, 1890, p. 102) gives further evidence collected during the last three years, in proof of his theory. The numbers he finds for three years were 10 or 15 per cubic centimeter in March to 2,500 in April, 1888, 1,100 in 1889, and on March 28, 1890, 5,000; the breaking up of the winter snows having occurred this year much earlier than usual. This is the period during which the winter snows are melting, and after this is completed there is no marked increase in the numbers of bacteria in the lake-water until the reappearance of the winter snows, some of the earlier falls of which, during October, November and December, melt and disappear. In December the number of bacteria per cubic centimeter sometimes reaches 600—the highest point recorded during the year, except in March.

Dr. Schmelk thinks that the increase is due to the action of frost in breaking up the earth's surface, from which the contained organisms may be set free as soon as a thaw occurs, and then washed away along the surface soil just as during great rainstorms. He also points out that masses of ice projecting into a river may form "collecting" points for particles suspended in the flowing water, as more bacteria are always found in the water obtained from such ice when melted than in the river-water itself. He verified this by repeated experiments. He found, however, that when floating ice was melting in water, though it contained a few more organisms than water collected near the surface, it held far fewer than water taken from a considerable depth.

In the Christiana water-supply he found some thirty species of bacteria, some of which occurred very seldom, some at certain periods of the year only, and a few all the year round.

The amount of solids in the water varies, from time to time, between 0.92 and 0.94 gram per liter, and traces of ammonia can usually be found in water during the time that it contains most bacteria.

SLEEPING SICKNESS OF AFRICA.

At the Harley House, London, says the *Medical News*, there is a young man, a native of the Congo River Valley, who has journeyed to England for the purpose of an autopsy. He believes himself to be in the incipient stage of the mysterious and incurable disease known as the sleeping sickness, and he has left his wife and children to place himself and his body, after death, at the disposal of the medical men, in order that they may so study his case as to ascertain the cause, morbid changes, and means of relief of this comparatively unknown malady.

The young man's name is Mankombi, and he is a member of the missionary church at the Banza Manteka station, where not fewer than sixty of his fellow-converts have been carried off by the sleeping sickness. His own sister is dying of it; she becomes almost maniacal at the full of the moon. His brother by marriage died by it at about the time of his departure, which was a spontaneous action on his part, in order that by dying in a foreign land he might perchance benefit his yet unafflicted countrymen.

Mankombi is yet well and able to work, but he is smitten with the trouble, as is shown to others by some little impairment of his mental alertness. The disease is not believed to be contagious, although several members of the same family may die of it. So far as the observation of the missionaries goes, no case has been saved from a fatal termination by treatment. The duration may extend for three years, or it may be only two or three weeks. As the disease progresses the patient is said to sleep his life away, although in severe cases maniacal symptoms develop.

Great emaciation marks the chronic cases. "Nelavan" is a term used by Declat and some other French writers as descriptive of

the sleep disease of Africa at some points to the north of the Congo; but on the west coast, where it appears to be epidemic, Declat thinks he has found some points of resemblance between nelavan and chicken-cholera. Mr. Stanley makes no reference in his last volumes to the occurrence of the disease among his carriers, not a few of whom were probably taken from the lower Congo districts, where the disease is most frequent.

SULPHUR AS A DISINFECTANT.

The Paris correspondent of the *Therapeutic Gazette* writes that Drs. Thainot and Masselin have recently completed a thorough investigation of the action of sulphurous acid on disease germs. These gentlemen had at their disposal the resources of the Pasteur Institute laboratory and the use of some vacant wards at the Charite hospital, and, owing to these facilities, were enabled to procure or prepare the various septic agents, and to conduct the disinfecting operations under conditions closely similar to those of current practice. A number of different viruses were simply exposed to the sulphurous acid in a room of fifty cubic meters (17,065 cubic feet) capacity, tightly closed with putty. The gas was evolved in various proportions, but the quantity of sulphur consumed was noted in all cases. The results were as follows: Septic vibrio, or Pasteur's septicæmia, was tried under four forms—that is, as bouillon culture, dried culture, serous discharge from a septicæmic Guinea pig, and septic powder. The last, obtained by drying the discharge to the shape of varnish on a glass plate and powdering, is exceeding virulent. Sulphurous acid gas proved, even in large proportions, utterly powerless in all cases. Symptomatic and bactericidial carbon remained unaffected, as a rule, though large proportions of sulphur fumes continued for forty-eight hours occasionally had some effect. Tuberculosis in cultures supplied by Professor Nocard, and in the form of sputa, fresh and dried; in all cases Koch's bacillus was found to have been destroyed by a twenty-four hours' exposure to the fumes, in the proportion of sixty grains of sulphur to the cubic meter (twenty-eight grains to the cubic foot). Even in sputa, the most refractory form, the bacillus will be killed, but the full dose of sulphur will be necessary. Glanders; cultures of full virulence will be destroyed after twenty-four hours' exposure to the fumes of sixty, and even fifty or forty, grams (twenty-eight, twenty-three and nineteen grains) of sulphur to the cubic foot. Typhoid fever; cultures of Eberth's bacillus from the morbid spleen; complete destruction after twenty-four hours with sixty grams of sulphur. Diphtheria; cultures supplied by Dr. Roux. After twenty-four hours and 60 grams of sulphur all Kleb's bacilli were entirely destroyed. Asiatic cholera; the only cultures procurable being rather old, the proof cannot be said to be quite satisfactory, yet the bacilli were easily affected by even small doses of sulphur. Guadaloupe farcy; virulent cultures of this peculiar affection of the ox, obtained from Professor Nocard, were invariably rendered inert after twenty-four hours' exposure to sixty grams of sulphur, but smaller proportions were unreliable. It is shown that in these experiments sulphur fumes were useless with septic vibrio and charbon; but in sixty gram doses to the cubic meter, and after twenty-four hours' contact, they destroyed the germs of tuberculosis, glanders, farcy, typhoid fever, diphtheria, and probably of cholera. The correspondent thinks that these experiments furnish sufficient reason why some good authorities have spoken so highly of sulphur fumes as an antiseptic, while on the other hand equally good authorities have pronounced them nearly or quite worthless.—*Druggists' Circular.*

SCHOOL SANITATION.

We frequently receive letters, says the Iowa State Board of Health *Bulletin*, stating that children had gone home from school and been taken down with diphtheria, scarlet fever, or some other infectious disease; or, asking in other cases whether the schools ought not to be closed as well as other public places because of the appearance of some infectious disease in the community.

We have in reply to the latter question time and again said that unless the disease exists in the form of an epidemic that it was better, safer not to close up the schools. Children as a rule are safer when going to school than during vacation. In the former case they have not time for social and close intervisitation, while in the latter not only the inclination but the opportunity for such visits is greatly increased.

The fact that children are taken with such a disease at school is no evidence that the disease was contracted there. The exposare leading to the attack was quite as likely, if not a good deal more so, secured outside of the school room. Still there are dangers from exposure in the school room that need to be pointed out and remedied so far as possible.

The dangers to be apprehended are from contaminated water, sewer gas, overcrowding and improper ventilation, the deposit of contaminated sputa upon the floor, the poisoning of the air from exhalation from pupils with diseased throats, nostrils or lungs, and by personal contact.

The water may be contaminated principally by being too near a cesspool, privy vault, defective sewer, or to yards or sheds where animals are kept. Should any discharges from parties having typhoid fever or diphtheria find their way into the water supply they would certainly, even in the most dilute form, produce in those using the water like diseases. This, of course, applies equally to other public buildings, or to private residences. Even should such personal excretions not find their way into a water supply, other diseases are caused by impure water, and the system is rendered much more susceptible to any infectious disease. Hence, the water supply of the school building should be carefully guarded, and if a well furnishes the water, it should be cleaned out at least twice a year, and should in no case be nearer than one hundred feet to any possible source of contamination.

Sewer gas in our cities is a frequent source of danger in our school buildings. Not only the air breathed, but water drunk may, by absorption of poison germs, be productive of sickness. The plumbing should be the best and most improved kind, and should be frequently looked after.

Overcrowding and improper ventilation are amoug the most frequent sources of air pollution; and this danger is as great in the village and country as in the city school house. Every school room that is to be occupied for six hours of each day should afford at the very least 250 cubic feet of air per hour for each pupil; and in addition at recess, noon and after dismissal in the evening should have the doors and windows thrown open so far as possible consistent with the preservation of a proper temperature. There is no disinfectant more valuable than an abundance of pure air. Children and their parents have often complained to us of the school-room being too cold, or of windows being thrown open so that cold currents of air passed freely in on them. A little tact on the part of the janitor or teacher would obviate any such complaint. A window or door, in cold weather, so far as possible, should never be thrown open on the side of the building against which the wind is blowing. Such a practice will almost always result in the children taking severe colds. The openings should be made on exactly the opposite side and even then the window should be provided with a board four to eight inches wide that would fit snugly under the lower sash when it is raised. The air would then be admitted at the junction of the two sashes and passing up between the lower and upper sash no current could take place.

If a child should be in a school-room with pulmonary consumption, or with the sore throat found in diphtheria, scarlet fever, whooping cough or measles, there is always danger from the sputa (the expectorated matter) that is thrown off and from the air that is poisoned in its passage from and over these diseased tissues. As a matter of course, such children should not be admitted to the school-room where it is known that these diseased conditions exist. There is always some danger, however, from the possibility of the presence of such. Under such circumstances the ventilation and sufficient air capacity above referred to would be invaluable. In addition, however, to this, the school-room floor should each evening, the windows being thrown wide open, be liberally covered with sawdust freely saturated with a strong solution of carbolic acid, and then carefully swept up, and thrown into the stove or furnace and burned. This sawdust and the careful sweeping would gather up all the dust and sputa on the floor and prevent its diffusion subsequently through the room by drying. In addition to that, if the room was known to have had in it a case of infectious disease the school should at once be

dismissed, and the room thoroughly disinfected by fumigation with sulphur, and by subsequent free ventilation. For this purpose it would not be necessary to close the room for more than one session.

The danger from personal contact may be greatly lessened by having a seat for each individual scholar. In many school houses the seats are so arranged that the pupils sit in pairs, and are thus during the entire session thrown quite close together. Such seating not only subverts the best discipline, but is very objectionable from a sanitary point of view. Should any infectious diseases exist in the one, the companion would be most likely to contract the disease if at all susceptible. The teacher, if infected with any infectious disease of the throat or lungs, would greatly endanger the little ones by kissing them as many are in the habit of doing.

Now, to carry out all the above suggestions would cause a good deal of additional care on the part of the teachers and some expense on the part of school boards, but we believe it would save many weary vigils, many broken hearts, many dollars and cents to the patrons of the school, beside inculcating some valuable lessons to the pupils and teachers and patrons in sanitary science and hygiene that would be practical in character, and lead to more healthy homes.

THINNESS VERSUS STOUTNESS.

The following facts on the value of emaciation, from the *Lancet* of September 27th, are of interest. Emaciation is a prominent feature in many diseases. Many of the phenomena of diseases are, in reality, efforts at repair. It will therefore be advantageous to inquire if some good purpose is not served by emaciation. To begin with diseases which affect the circulation, in many such we may note that the patient will rapidly lose flesh, and when the loss has proceeded to a certain degree it is arrested. The patient becomes and continues thin. Not only is it difficult to fatteu him, but he is not mnch benefitted by the attempt. Should his disease be arrested, but leave some injury behind, the patient will probably continue thin. Instinctively, in consequence, we look for the presence of disease, active or quiescent, in sparely developed persons; and practically we look for it in the territory of the circulation, either pulmonary or systemic, and generally find something. Such emaciation, ceasing at a certain point, does not much exceed what is seen in athletic training, and may be defined as an involuntary training, forced upon the patient by his ailment. What, briefly, is the benefit of training? Unusual effort in untrained men or animals is checked, not by muscular exhaustion, but by congestion of the pulmonary circulation, and paralysis of the right ventricle of the heart. The effect of training is to enable the pulmonary circulation to keep pace with the increased activity of the systemic. Several changes concur to this end,—dilatation of the lung and of its blood-vessels, hypertrophy of the right side of the heart, and most especially absorption of every tissue which is found to be superfluous for the effort in view. This absorption reduces the area of the systemic circulation; and it is followed by a reduction in the quantity of blood, because a smaller quantity wlll suffice for active circulatiou through the lesser area. The individual so trained is in the condition of having a pulmonary territory larger than is necessary for his state of rest, and consequently with a greater margin for relief upon exertion. Conversely, the contrary condition of obesity develops the systemic circulation to the full capacity of the lungs, so that the least exertion will produce dyspnœa. Acute disease being like exertion, we can see the advantage of entering upon it in a state of training. The exhaustion to be feared is that of the heart's right ventricle; and the inconvenience of existing stimulants is, that they do not stimulate the right ventricle by itself.

To return to emaciation as produced by disease. Let us first take the case of diseases of the lung. Should the territory of the pulmonary circulation be diminished by such a disease as phthisis, it would be impossible for the patient, without emaciation, to have an active circulation of the systemic area without danger of congestion of the lung. The feeble attempts that are made at hypertrophy of the lung in this disease are thus met half way. The same thing is true of all emphysema of the lungs, whether senile or morbid. Then we may consider the disorders of the greater circulation. In disease of the valves, when the muscle has to do the work of the valves, and in decay of the aorta, when the ventricle has to combine the aorta's duty with its own, the smaller the volume of blood to be dealt with, the better. Without reduction of the area through which it flows, a reduced amount of blood would only result in a sluggish circulation. Emaciation in such cases is therefore salutary. Moreover, the capillaries are the seat of greatest friction; they are therefore the part to be reduced. This is the reason why all animals, in a state of nature, grow thin, as they grow old. Man, and the creatures under his control, may violate this law, but not with impunity. Acute diseases, when the arteries are decayed, is doubly dangerous. The right ventricle of the heart may be exhausted, as before, but now the left ventricle may also prove unequal. Stimulants here can have but little drawback; but in surplus lung, and an amount of blood that is well within the powers of propulsion, lies a greater safety. Obesity is dangerous to the aged.

It would be well to consider the phenomena of waste in fever by the light of an assumption that they are salutary. The brute creation, when suffering from fever, eat nothing; yet they do not die, but recover. The body seems destined to feed upon itself, and to delay all repair until convalescence. Great responsibility rests upon those who supercede this instinct by an artificial method. Graves, who fed fevers, at the same time bled his patients. Venesection has this drawback, that to relieve the right heart we are obliged to stint the left, and to reduce the systemic circulation to a sluggish flow. The speedy repair of such loss of blood shows that its benefit must be only temporary. Such a remedy is an imperfect substitute for a capacious lung. The perception of this inconvenience has led to the disuse of bleeding. The concomitant pressing of food in fevers should probably follow it. The most evident of natural remedies for any kind of fever are starvation and emaciation. However indulgent appetite may be in health, it returns in disease to the strictest authority. Obedience to its dictates may shatter superstitions, but will not jeopardize the cure. In chronic diseases, the physician who thinks of the future of his patient will look grudgingly on fat. It provides for warmth and irregularity of nutrition. If these be provided for in other ways, much relief can be given to the circulation; and if in acute disease the presence of a tissue should prove an embarrassment, the physician will not interfere with its removal.

DOMESTIC SMOKE.

At the Manchester Technical Laboratory Mr. George E. Davis recently delivered a lecture on "Domestic Smoke." Dr. Ransome, chairman of the Manchester and Salford Sanitary Association, presided. The lecturer said that domestic smoke was the cause of much evil. It injuriously affected the health of a community, destroyed public buildings, deteriorated perishable fabrics, injured vegetation, and entailed unnecessary expense, while in combination with fog, smoke diminished vitality, a fact for which there was ample testimony. He maintained that if every householder understood the real bearings of the smoke question they would approach the time when fogs would become things of the past. He had visited almost every exhibition of appliance for minimizing domestic smoke, but he had not seen one appliance which would yield a smokeless house fire under ordinary conditions, while he had seen so-called smokeless grates which caused more smoke than the ordinary grate. He did not know of any practical method by which the sulphurous acid could be satisfactorily extracted from household smoke when once the sulphur had been gasified. There was, however, patent fuel on the market which prevented sulphurous acid being given off. It was a little more expensive than ordinary fuel, but if they were to have a purer atmosphere, he contended that some sacrifice would have to be made by householders. Slow combustion stoves, of a good pattern, produced less smoke than any other appliance he knew of, but by that appliance the sulphurous acid was not entirely overcome. He recommended the more general adoption of gas for heating purposes, and remarked that if a company was formed to supply gas at 1s. per 1,000 ft. for domestic purposes, it would be a grand commercial success. Dr. Ransome said that a sooty atmosphere had an indirect influence on the health of towns by causing housewives to shut their bedroom and other windows against its contaminating effects. Improper ventilation

caused, he believed, an excessive amount of consumption. There were abundant proofs that confined air, produced by the want of proper ventilation, was one of the chief causes of consumption, and that neglect of ventilation was often attributable in large towns to the smoke which pervaded the atmosphere.

THE WATER-SUPPLY OF PARIS.

In the course of an article dealing with the sanitary condition of Paris, as affected by the present systems of water-supply and sewerage, the *Engineer* recently made the following remarks:

"There is no government department which has been more active in France during the past few years than that of public works; and the engineering enterprises undertaken under its auspices have undoubtedly done much to develop the internal resources of the country. But little has been done in the important matter of sanitation; and at the present moment Paris, with its magnificent highways and bridges, is provided with a system of sewerage of the most primitive order. Ineffective sewerage and a bad water-supply are, in truth, the principal factors in determining the very much higher death-rate of Paris than of London; and to realize how bad these are, it is only needful to regard this discrepancy in the mortalities of the two cities, in relation to the fact that the other conditions of Paris are far more favorable to a low death-rate than are those of London. The question of the Parisian sewerage will have to be dealt with before very long; but works are at present in train for providing a more satisfactory water-supply. A good deal of progress has already been made toward this end, of which the latest step was the recent construction of the reservoir at Montmartre.

"Even during the past summer, however, the inconveniences of the present system of water-supply have been severely felt. The service of pure spring-water carried by aqueducts into the city is not sufficient to meet all the necessities of Paris; and when it is found insufficient—a thing which generally occurs during the hot and dry months of the year—it is necessary to substitute Seine water for some weeks together. This step has been taken this year, and the discontent which it evoked perhaps had something to do with inducing the Chamber to approve the long-debated scheme for bringing an adequate supply of 'source' water into Paris. This is to be done by means of an aqueduct, which will transport the waters of the two small streams, the Avre and the Vigne, from their source in the department of Eure-et-Loir into Paris. The plans for this work have now been all prepared, and the necessary legal steps for the acquirement of land have been taken. The aqueduct will run through the two departments of Eure-et-Loir and Seine-et-Oise, and will discharge into an enormous reservoir to be built at Montretout. The most interesting part of the work, from an engineering point of view, is the tunnel which is to convey the water under the heights of Marly and the Park of St. Cloud. This tunnel will commence upon the borders of the Park of Versailles, and will run as far as Villeneuve-l'Elarg—a distance of about 4¾ miles. Its depth below the ground will, in some parts of the route, exceed 215 feet. Work has already been commenced on this portion of the undertaking. Fifteen shafts have been sunk at distances of about 550 yards. This preliminary work has not been carried on without difficulty. It is found that the sandy soil of which the hills west of Paris are composed is completely permeated with water at a little distance from the surface. Operations are therefore carried on by sinking a metallic lining, consisting of two concentric cylinders, secured together by iron braces and strengthened by masonry. At the bottom the two cylinders join, and they terminate in a steel attachment with a cutting surface, which sinks into the wet sand under the weight of the cylinders. Inside this tube, which is ten feet in depth, workmen can safely carry on the work of removing the soil, and with its progress the tube is lengthened out by the addition of new ones. Other noteworthy features of the works in connection with the scheme are the construction of an iron aqueduct across the Seine bridge, the erection of new machinery at Clichy, the laying of an extensive series of pipes through Paris, and the building of the Montretout reservoir. This reservoir will contain three compartments on the same level, each of them holding 4,500,000 gallons of water; and the entire capacity of the reservoir will be sufficient to supply Paris for three days. It will be covered with brickwork arches turfed over. On the whole, it may be hoped that the Parisians are at last in a fair way to escape from the compulsory limitation of water consumption to which they have so long been condemned."

COINAGE AND INFECTION.

It is no new doctrine says the *Lancet* that in the presence of infectious or contagious disease every object may become endowed with a mischievous faculty of transmission. Nothing is exempt, though some substances are naturally better fitted to act as media than others. Such substances as clothing and carpets may be placed in the first rank, and paper, especially in the book form, hardly second. The scrupulous rigor with which measures of purification are adapted in regard to all these is proof of the wholesome suspicion with which they are commonly invested. It was not to be expected that paper money could escape the stigma, nor should it. Even solid coin has latterly been credited with the same maleficent property. It cannot be denied, indeed, that any penny or shilling may thus be made to bear a novel and mischievous increment of its own. At the same time we can avail ourselves of the relief afforded by modifying circumstances. It is well, for example, to remember the wholesome qualifications introduced by the moving and ventilating process of currency, by the protection of a purse, and by a generally smooth and well-polished metallic surface. On a critical examination of the subject, we are tempted, notwithstanding, to look back with some regret to the old custom of washing change. To insist upon this in ordinary cases of infection would, indeed, be fanciful and unpractical, though we might forgive such pious care. Where, on the other hand, we had to deal with foul and active contagion, we should not care to ridicule one who disinfected his change. In so doing, he only obeys the suggestion of cleanliness and caution.

TRAPPING AND VENTILATING.

Editor of THE SANITARY NEWS—As an old reader of your paper I wish to give you my opinion on trapping and ventilating plumbing work. I may be wrong, but a person never knows that his ideas are right or wrong until he gives them to some one who has a chance to know as much or more about the same subject. There was a time when it was thought that to trap a fixture was a sure protection against sewer gas, and the only trap used was the common S trap (this was the idea of the plumbers at that time), but through experience they found that a common S trap, without any other attachment was a dangerous thing to have, and it put the plumber to thinking of something better, something that could not be syphoned, and would always have a seal against sewer gas. They have invented numerous traps, combinations of all kinds but as far as I can see the more complicated they are the more filthier they are, and I have come to the conclusion that a combination trap is unnecessary, is uncalled for, unsanitary, and ought to be something of the past. We have arrived at the time when we know that ventilation is the only thing theoretical and practical that will give satisfaction, and leave every house in a good sanitary condition. Every trap and fixture in a house should be ventilated. The waste-pipes should not be too large; they should be regulated according to what they are to be used for. There is danger of plumbers getting the waste-pipes too large and the vent-pipes too small. Vent pipes cannot be too large; they ought to be one size larger than the waste pipe, and should be increased every ten or fifteen feet to allow the air to move freely, and where the trap is vented where is the need of a combination trap? The danger of having the seal broken by syphonage is overcome by ventilating. There are some combination traps that might be used to a good advantage in some cases, that is in cases where the seal is liable to be broken by evaporation, but in no other case do I approve of a combination trap. Ventilate and they will not be needed. Use a good simple wash-out trap, ventilated in such a way as not to endanger the seal by evaporation.

A vent pipe should be taken from every trap on the sewer side, and carried out through the highest part of the roof; and one should be taken from the fixture side of the trap and carried into the kitchen chimney or into some stack that is always heated. Common wrought iron pipe should be condemned. I don't think there is anything you can put in that will gather more filth than common black wrought iron pipe. Black cast

iron is bad enough, but in my opinion it is not a circumstance to wrought iron pipe. W. A. K.

WINDOW DRESSING.

In considering the subject of window dressing, the merchant or the clerk who has this particular branch of the business in charge, should bear in mind what he hopes to accomplish by it, says an authority on this subject.

"He aims to set forth a fair sample of the goods to be found within. They must be so displayed as to prove an attraction to the people on the street, most of whom are intent upon going somewhere else than to his store. Their attention must be diverted from their original purpose sufficiently to excite in them the desire of possession. To do this the goods displayed must be of such a character as will appeal with force to the purchaser at the time he is looking at them. In a word, the window must be dressed with seasonable goods.

"Seasonableness is not the only requisite in window dressing. It is manifestly quite unnecessary to go to much trouble to decorate a window with common goods which are so well-known that they will attract no attention from the passer-by. His attention must be secured first by some feature with which he is unfamiliar. Second, his attention having been attracted, his curiosity must be gratified, and he must not be allowed to go away disappointed.

"That it pays to award particular attention to window dressing seems to be the opinion of every merchant who has systematically tried it. When one goes by a store in which the windows are filled with shop worn goods which have been seen there since Adam was a child, to speak figuratively, and in which the glass is dirty and lined with cobwebs, a feeling of disgust is hard to repress. It is difficult to see how people of refined taste can continue to trade in such a place. We believe if such a Rip Van Winkle store keeper should awake, wash off his windows and make a good display, his trade would be increased at once.

"Those who have tried the efficacy of window dressing as a means of drawing trade are enthusiastic in its praise. We consider the storekeeper's window his cheapest advertisement. In a newspaper he can but describe his goods and give his reasons why they are bargains. In his window he can display the goods themselves with or without prices, as he deems best. Is not the dealer's window his sign of cleanliness, thrift, taste and business enterprise? Is he not rated in the public estimation according to his indicator? And what is his indicator? To the public gaze what can it be but his window? The window stands there gazing out on the particular spot wherever located. It stands there, no matter where its owner may be, continually enticing the public to the spot."—*Newsman.*

AMONG THE PLUMBERS.

Robert O'Donnell was arrested on December 29th for doing defective plumbing work and not reporting the same to the Health Department. Justice Wallace was of the opinion that Mr. O'Donnell should pay $110 and costs for this offense and so rendered his decision. The case was appealed but will be disposed of very soon, and the delinquent will be made to realize the importance of this department which is now doing such effective work in protecting the health of the citizens of Chicago.

The master plumbers of Washington, D. C., recently held their last meeting of the year 1890 at the Owen House. The principal object of the meeting was the election of officers for the year 1891. The successful candidates were: James Ragan, president; E. F. Brookes, vice-president; James Cunningham, secretary and treasurer, Joseph Quinter, sergeant at arms. As soon as the business of the evening was transacted the members sat down to a sumptuous repast that had been prepared especially for master plumbers. Among those present were J. I. Atchison, S. S. Shedd, James Nolan, John Caghan, F. N. Devereux, Charles Lockhead, James Campbell, Daniel Hannan, W. W. Dougherty, James Lockhead, Bowden Beuchler, George A. Green, R. McBee and Joseph Quinter.

Inspector Michael O'Connell, of the Health Department, continues his relentless pursuit of the derelict in the plumbing profession. Last week he had arrested for defective work, Robert Love, John Leibold and Thomas F. Rock. Mr. O'Connell came in and pleaded the cause of the people of the state of Illinois, and succeeded in securing a fine of $110 and costs against each of the offenders. His success in pleading the cases of the Health Department prove that Mr. O'Connell should have studied for the legal profession instead of engaging in the plumbing business.

The Christmas greetings of the National Hot Water Company reached us in the form of a beautifully printed card in colors, and bearing in one corner a bright new penny, "Gratify your wants fully," said the card. Let pleasure have full sway, but avoid foolish extravagance, remembering that "A penny earned is a penny got." We are pleased to inform the above company that their cash contribution to our holiday extravagance was well spent. We thought of contributing it to the World's Fair fund, to the Drainage Commission or to the suffering Indians, but finally concluded to put it in the cup of charity, and ere this time we hope it has made some life as bright as the gleam of the coin itself.

Some of the master plumbers had too much Christmas, but the majority of those thus affected are slowly recovering and will soon be around to their accustomed posts.

Atlanta, Georgia has fallen in line and now boasts of a master plumbers association. C. W. Hunnicutt is president and John L. Mell is secretary.

National President Robert Griffith has sent out another request for all local associations to send in the names of their acting presidents and secretaries to the National Headquarters of the National Association of Master Plumbers of the United States at 427 North Clark street, Chicago. Mr. Griffith especially desires the names of these officers before the meeting of the Executive Committee of the N. A. M. P. at Cincinnati, Ohio, next month. Let every master plumber consider himself a committee of one to see whether the national association has the names of the officers of his home association.

Chief-Inspector Andrew Young has returned from his Southern trip, where he attended the convention of the American Public Health Association. Mr. Young speaks in high praise of the work that this association is doing. It was Mr. Young who first suggested the idea of the master plumbers joining the American Public Health Association, and he has represented the National Association of Master Plumbers in the former association on several occasions. Mr. Young thinks that the usefulness of the Health Association will increase as the number of practical men increases in that organization. He says that the physicians point out the disease and its cause, but the practical plumber points out the remedy.

The master plumbers are busy keeping the good resolutions they formed on New Years day. A resolution common with them all was not to do any work during the coming year for less thau the cost price.

The presiding officers of the new Master Plumbers' Association at Charleston, S. C., are C. W. Paddon, President, and A. B. Biddock, Secretary.

The Kansas Master Plumbers' Association recently held a very important meeting at Wichita, where the needs of the state association were discussed, and steps taken to remedy the existing evils.

National President Robert Griffith attended all the meetings of the American Public Health Association. He was appointed at the Denver Convention of Master Plumbers to represent this association in the American Public Health Association. Mr. Griffith did some splendid work for the master plumbers while in the South. Besides representing the plumbers' association so ably in the national convention of noted physicians, he looked after the interests of the master plumbers in a practical manner, and organized several new associations. He stopped at Chattanooga on his way South, and called on all the master plumbers there. As a result of his short stop, the Chattanooga Master Plumbers' Association was formed. He reached Charleston on December 16th, and, after calling on the principal plumbers of the city, he called a meeting for 12 M. December 18th, at the Waverly Hotel. The leading business questions were discussed at this meeting, and then an adjournment was taken until six o'clock. At the evening meeting the Charleston Association of Master Plumbers

was formed. On Friday evening he left for Atlanta, Georgia, where he succeeded in getting the plumbers together and forming an association. He spent one day and night with the Louisville plumbers on his return, and reports everything moving along nicely in that section of the country.

EDITOR OF SANITARY NEWS: There will be a meeting of the Executive Committee of the National Association of Master Plumbers in the Gibson House, Walnut street, between Fourth and Fifth streets, Cincinnati, Ohio, Monday, January 26th, 1891, at 10 o'clock A. M. It is hoped that every member of the Executive Committee will be present at that meeting. It is also earnestly requested that every association in the entire country send the name and address of their President aud Secretary to headquarters, previous to date of above meeting.

Very respectfully, JOS. R. ALCOCK, Sec'y N. A. M. P.
ROBERT GRIFFITH, Pres't N. A. M. P.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Little Rock, Ark.: A. Druiding, of Chicago, has made plans for a school-building, to be erected for St. Andrew's Cathedral; cost, $48,000.——Glencoe, Minn.: The Catholic Church will erect a church edifice, to cost $23,000. A. Druiding, Chicago, architect. ——Nemaha County, Kan.: Bettinghofer & Herman, of Chicago, have made plans for a new Catholic church.——Chelsea, W. Va.: A three-story hotel will be erected. Jul de Horvath, of Chicago, architect.——Brooklyn, N. Y.: Macon street, near Reid avenue, five two-story brick and stone dwellings; cost, $24,000. A. Hill & Son, architects. Decatur street, near Saratoga avenue, five two-story brick dwellings; cost, $22,500. Isaac D. Reynolds & Son, architects. Architect Wm. A. Mundell has been appointed by the Fourteenth Regiment Army Commission to draw the plans for the new armory and superintend its construction.——Chicago: Fifty-ninth and State streets, a three-story store and flat building; cost, $400,000. H. B. Wheeler, architect. Forty-seventh street, near Emerald avenue, a three-story building; cost, $300,000. Martin Carr, architect. Ashland avenue and Eighteenth, a hall and theater building; cost, $50,000. J. A. Wiershiemic, architect. Thirty-seventh street, near Vernon avenue, a block of six modern flat buildings; cost, $60,000. Snyder & Nathnagel, architects. Elizabeth Court, near the Rock Island tracks, a five-story mill and elevator. Fromnean & Jebson, architects. Francis Lackner will erect a $15,000 residence at 381 Dearborn avenue. 3612 Grand boulevard, a three-story residence; cost, $20,000. J. A. Thain, architect. Wood street and North avenue, a three-story store and flat building. Wm. Ohlhaber, architect. Miss Minnie Parker, of Philadelphia, is at work upon plans for a World's Fair Fountain, to be erected by the Queen Elizabeth Association of Chicago. Western avenue and Powell Park, two apartment buildings; cost $100,000. S. M. Randolph, architect. Grand boulevard, near Forty-first street, remodeling of two residences. Wm. Thomas, architect. Hudson and North avenues, a four-story store and flat building. Bettinghofer & Herman, architects. Newport avenue, near the Sheridan drive, a residence; cost, $25,000. Jul de Horvath, architect. John T. Long is taking figures on a row of eleven residences to be erected on Calumet avenue, near Thirty-eighth street; cost, $50,000.——New York City: Market and Henry streets, a six-story brick store and flat; cost, $40,000. Chas. Rentz, architect. Thirty-fifth street, West, near 128th street, a five-story brick flat; cost, $38,000. D. Burgess, architect. 102d street, near Columbus avenue, five six-story brick flats; cost, $100,000. J. W. Cole, architect. Broadway, west side, opposite Wall street, church improvements; cost, $100,000. R. M. Hunt, architect. G. A. Schellenger has plans for a six-story apartment house, to be erected on Seventy eighth street, near Ninth avenue; cost, $60,000. The same architect has plans for five three-story brick and stone dwellings, to be erected on West End avenue and Eighty-eighth street. James W. Cole has designed five five-story stone flats, to be erected on 102d street, near Ninth avenue; he has also designed a six-story brick, stone and iron factory, to be erected on Greenwich street, near Clarkson street; cost, $75,000. Alfred Zucker is the architect for a six-story stone and brick warehouse; cost, $78,000. E. D. Angell has designed a seven-story brick and stone apartment-house, to be erected on the corner of Boulevard and Eighty-third street; cost, $175,000. Thom & Wilson are the architects for a five-story brick and stone stable, to be erected on the corner of Eighty-fifth street and Tenth avenue; cost, $70,000 Ninety-sixth street, near Columbus avenue, four five-story brick flats; cost, $20,000. H. Davidson, architect.——Detroit, Mich.: Southwest corner of Porter and Second streets, a brick hospital and sanitarium; cost, $50,000. Donaldson & Meier, architects. Northeast corner of Trumhill avenue and Pine street, a two-story frame residence; cost, $7,000. Malcomson & Higginbotham, architects. Warren avenue, between National avenue and Twelfth street, four two-story frame residences; cost, $8,000. John R. Gentle, architect.——Holyoke, Mass.: High street, brick block of stores and tenements; cost, 20,000. G. P. B. Alderman, architect. ——Johnstown, Pa.: The brick hotel to be erected at this place will cost $72,000.——Milwaukee, Wis.: Tenth and Cold Spring avenues, a boiler-house; cost, $40,000. Pabst Brewing Co., owner. ——Moberly, Mo.: It is proposed to erect a city hall.——Mobile, Ala.: A brewery is to be erected by A. S. Lyons.——Pen Argyl, Pa.: The M. E. congregation will erect a church; B. T. Callen, pastor. L. S. Jacoby, architect. ——Pottstown, Pa.: L. & W. C. Beecher will erect a store house for dry-goods store; cost, $20,000. R. M. Root will erect a storehouse for hat store; cost, $7,000. The estate of D. K. Hatfield, who are burned out, will build on their lot.——Fitchburg, Mass.: Sufficient stock has been taken, and the Mitchell Company, of Glasgow, Scotland, will erect a gingham mill here in the spring.——Grand Rapids, Mich.: Northwest corner of Fountain and Bostick streets, a three-story brick business and tenement block; cost, $10,000. J. H. Dauermann, architect. ——Woodville, Tex.: A $30,000 court-house will be erected.—— Springfield, Mass.: Bridge street, a brick industrial-fair building; cost, $35,000. B. H. Seabury, architect.——Temple, Tex.: The Catholic congregation have begun work on a new $30,000 stone church.——New Haven, Conn.: Plans are being prepared by the New York, New Haven & Hartford Railroad Company for a union depot.——Osakis, Minn.: The Great Northern Railroad will erect a new depot.——Greenville, Tex.: The Missouri, Kansas & Texas Railroad will erect large shops.——Providence, R. I.: The sum of $75,000 has been appropriated for new school-houses.——Salt Lake City, Utah: West Temple street, corner Second South street, a six-story stone building; cost, $150,000. Mendeshon Fish, architect. ——South Bethlehem, Pa.: Market and Linden streets, a brick and stone building; cost, $15,000. A. W. Leh, architect.——Worcester, Mass.: Pleasant street, a brick theater; cost, $20,000. W. R. Forbush, architect.——Cambridge, Mass.: Brookline street, a brick factory.——Chattahoochee, Fla.: A $20,000 addition is to be built to the insane-asylum.——Abilene, Tex.: A Baptist college and other necessary buildings are to be erected, at a cost of $25,000. Mr. Archer, architect, has just completed the plans.——Boston, Mass.: 336 Congress street, a brick building; cost, $40,000. M. D. Safford, architect. St. Botolph street, corner Cumberland street, a brick school-house—"Prince Primary;" cost, $75,000. Address the City Architect. 235 Heath street, a brick brewery; cost, $65,000. F. N. Footman, architect. S. s. 102d street, near Columbus avenue, five brick flats; cost of all, $100,000.——Colorado Springs, Colo.: Mr. A. Long will erect a business block and a $75,000 hotel.——Corpus Christi, Tex.: Messrs. Gordon & Lamb, architects, of San Antonio, Tex., have prepared plans for a magnificent new opera-house which is to be erected at this place.—— Greenville, Tex.: A $20,000 college is soon to be erected.——Minneapolis, Minn.: 757-61 Washington auenue, a three-story brick store and flat- cost, $28,000. Edward S. Stebbins, architect.—— Fayette Court-House, Ala.: The Alabama Legislature has before it a bill authorizing Fayette county to issue $20,000 of bonds to build a court-house and jail at Fayette Court-House.

HEATING AND LIGHTING.

Columbia, S. C.: A bill has been introduced in the South Carolina legislature providing a charter for the Columbia Electric Street and Suburban Railway and Electric Power Company.—— Clifton Forge, Va.: George Swan, R. J. James, E. G. Roberts and others are endeavoring to organize a stock company to erect a $25,000 electric light plant.——Galveston, Tex.: The Galveston City Street Railway Company will erect an electric power plant

120x84 feet.——Lincoln, Neb.: This city has just contracted with the Lincoln Gas and Electric Lighting Company for sixty arc lights.——Stratford, Conn.: Boston parties are considering the advisability of putting in a gas and electric light plant at this place.——Northampton, Mass.: The Northampton Gas Company will enlarge its plant in the early spring.——Dallas, Tex.: Extensive improvements are about to be made to the plant of the Dallas Electric Company.——Henderson, Ky.: An electric lighting plant is to be established. Mr. Kimmel can furnish details. ——St. Louis, Mo.: The Stevenson & Hogson Electric Company is a new institution at this place. Capital, $10,000. Address William H. Stevenson.——Du Page County, Ill.: The Village Electric, Gas Light and Railway Company has been incorporated here by Messrs. William H. Porter, Charles S. Reed, and others. Capital $50,000. The purpose is to construct electric and gas plants, and to furnish gas and electricity for illumination and power in Du Page county.——Burlington, Vt.: The Burlington Electric Light Company has increased its capital stock to the sum of $50,000, and will at once make extensive improvements to its plant.——Williamantic, Conn.: The Citizens' Gas Light Company has been incorporated for the manufacture, sale, etc., of gas. Capital stock, $5,000. Shareholders: E. S. Boss, Julius Pinney, Luther Hill, and others.——Somerville, Mass.: The Somerville Electric Light Company is to increase the capacity of its plant from 500 to 1000 horse-power.——Chicago, Ill.: The Bear Magneto Electric Company has been organized for manufacturing and doing a general light, heat and power business. Capital stock, $3,000,000. Incorporators. Simeon J. M. Bear, William R. Northway and Franklin Babcock.——Denver, Col.: $120,000 will be expended this year for electric lighting.——Riverside, Ill.: The Riverside Edison Company has been formed to furnish electric light and power. Capital stock, $40,000. Incorporators, W. W. Hutchinson, Lewis Lusk and Mathew C. Myers.

SEWERAGE NOTES.

Avondale, Ala.: A bill will be introduced in the Alabama legislature authorizing Avondale to issue $15,000 of bonds for the construction of sewers, etc. ——Bessemer, Ala.: The city has received authority to issue $50,000 of bonds for the construction of sewers and other improvements. The mayor can give information.——Spartanburg, N. C.: The city will issue bonds for the construction of a sewerage system. The mayor can give information.——North Knoxville, Tenn.: The common council, at a recent meeting, commended the action of the citizens' mass meeting, which resulted in recommending that improvement bonds in the sum of $500,000 be issued, to be used in constructing and completing a system of sewers, building bridges and paving streets. A resolution was adopted appointing a committee of citizens and officials to investigate the propriety of asking the next legislature to authorize North Knoxville to issue said bonds, and to report their action to the common council. Mayor Gratz can give details.——Lexington, Ky.: It is proposed to extend and improve the sewerage system.——Woodland, Cal.: The sewer question is being discussed by the city officials.—— Macon, Ga.: The Boifeuillet sewer bill passed the House December 17th.—— Rochester, N. Y.: A new plan has been submitted by Mathias Kondolf for the proposed east side sewerage system. Samuel L. Gray, of Providence, will not make his report upon Engineer Kuichling's plan until after another visit to Rochester.——Mt. Vernon, Ohio: The city is putting in a new system of sewers. ——Richmond, Ind.: It is proposed to build a trunk sewer about 6,000 feet in length during the coming year.——Savannah, Ga.: A plan for house drainage is under consideration.

WATER-WORKS NOTES.

Montesano, Wash.: The water supply question is under discussion.——Colorado Springs, Col.: The city council has ordered the issuance of $50,000 of water bonds.——Bridgeport, O.: The city council has decided to construct a system of water-works.—— Albany, N. Y.: Surveys are being made for the works by which it is proposed to supply the city with water from the streams above French's mill in Guilderland.——West Troy, N. Y.: The health board of West Troy attributes the large number of typhoid fever cases to the impure condition of water supplied from the Mohawk river, and has ordered the supply shut off. The board have also ordered the village sewers to be flushed every twenty-four hours. ——Plymouth, Pa.: The Plymouth Water Company will increase its capital stock from $100,000 to $125,000.——Belleville, Ill.: Owing to the inadequate supply of water for fire protection at Belleville, the city council has directed that the fire cisterns be put in order for the storage of surface water, and that arrangements shall be made with the proprietors of the Hinckley mills for a supply of water from their spring into the pond at Third and Spring streets. This is understood, of course, to be but a temporary arrangement. ——North Knoxville, Tenn.: At a meeting of the common council held December 20th, the water-works question was considered, and the following resolution was adopted: That a committee be appointed to whom shall be referred the propositions now made, and other propositions as may be submitted, and they may investigate and recommend to the council such propositions, or any, as may seem best to them, accompanied by proper ordinance. That such propositions shall be submitted not later than December 20th, and that the committee report to a special meeting to be held December 31st. Mayor Gratz and Alderman White are on this committee, and can furnish information.——Kansas City, Mo.: The Special Water-Works Committee will, in its report to the city council, advise leaving the water question to the taxpayers to settle at a public election. This relates to the proposition to buy the old plant or build a new. ——Auburn, Me.: The city council has voted to apply to the legislature for power to establish a system of water-works. Councilman Davis is at the head of the movement.——Salem, Ore.: The Salem Water Company is making arrangements to extend its mains to the Fairmount Park. They will build a 2,000,000 gallon reservoir and make improvements that will cost $50,000.——Woodland, Cal.: It is proposed to bond the city in a sufficient amount to establish a system of water-works.——New Orleans, La.: The question of increasing the water supply in portions of this city is being agitated by the local press.——Norfolk, Va.: It is probable that the work of improving the local water supply will be taken up at once. The city engineer can furnish particulars.——Sterling, Col.: The town has issued $10,000 in bonds, the citizens have subscribed an equal amount, for the construction of water-works. It is expected the work will be set on foot early in the spring. Address R. W. Wood.——Leesburg, Fla: The city has the subject of water-works construction under consideration.——Owens Valley, Cal.: The Owens Valley Water Company has been incorporated, to obtain riparian rights and construct water courses through Owens River valley and Indian Wells valley and to sell water. Directors:—Andrew J. Robinson, J. W. Wesson. G. P. Rixford, A. I. Sanborn, O. E. White, H. Oterson and J. F. Turner.——Geneseo, N. Y.: The village has voted to raise a sinking fund of $3,000 annually for the payment of sewer and water boards.——Bristol, Pa.: The Bristol Water Company will increase its capital stock from $50,000 to $65,000 and issue the new stock as a dividend to the present stockholders.—— Dubuque, Ia.: The advisability of the purchase of the water-works by the city is being considered. Under the terms of the franchise it now has the right to buy them.——Kingman, Kan.: The Kingman Water and Light Company has been organized. Capital stock, $100,000. Directors:—Frank Vincent, John F. Vincent, Hutchison; John W. Hood, Clay Center; Robt. G. Brodie, Emporia; Vernon C. Jarboe, Kansas City, Mo.——Auburn, Me.: The city council has passed an order to ask the legislature for authority to establish water-works under municipal control.——Quincy, Mass.: The water-works question will be further discussed by the city council next week.—— Grand Rapids, Mich.: It is now proposed to amend the charter of Grand Rapids so that the city council may borrow about $75,000 for the extension and improvement of the water-works without submitting the matter to a popular vote.——Argonia, Kan.: The water-works question is to be decided at a special election.——Batesville, Ark.: The Batesville Water and Electric Light Company has been incorporated, with Samuel B. Hartz as President. Capital stock, $100,000.——Rushville, Ind.: A franchise has been granted to a local company, which will at once put in a water-works plant.—— Mason, Mich.: Conclusive steps will soon be taken toward establishing a system of water-works.——Fairland, Tex.: The Fairland Water-Works and Park Company has been incorporated, with Eugene Sweeny at its head. Capital stock, $25,000.——Blue Shrings, Neb.: At a special election, held December 30th, $8,400 in bonds were voted, to put in a small stand-pipe system. The water will be

taken from springs.——Lincolnton, N. C.: The city will petition the Legislature for authority to hold an election on the question of issuing $20,000 of bonds to construct water-works, improve streets, etc. ——San Francisco, Cal.: The fire department committee of the Board of Supervisors has agreed to purchase another water-tower within six months. The members of the committee state that by that time there will be money on hand with which to make the purchase.——Hill City, Tenn.: The construction of a system of water-works is talked of at Hill City.——Danville, Ky.: Knoxville parties have submitted a proposition to construct a system of water-works at Danville, Ky. The Mayor can give information.——Morristown, N. J.: The water company will build a new reservoir in the spring. ——Scranton, Miss.: The construction of a system of water-works is proposed. The Mayor can give information.——Pueblo, Col.: At a meeting of the water-works trustees on December 16th, the superintendent was directed to advertise for bids for furnishing pipe and specials for mains recently ordered laid.——Atlanta, Ga.: At a recent meeting of the city council, the ordinance providing for the issuance of $250,000 of water-works bonds was concurred in. The action of the council in contracting for water-mains was not concurred in.——Minersville, Pa.: The Forestville Water Company has been organized to supply water in Cass township, Schuylkill county, Pa. The capital is $5,000 and the office will be at Minersville.——Sherman, Tex.: The city will extend its water-works.——Philadelphia, Pa.: The specifications for the new 20,000,000-gallon pumping engines for the Spring Garden water-works station at Philadelphia has been approved, and bids will be opened for them in February.—— Tacoma, Wash.: The chief of fire department has rocommended the purchase of pompier ladders and the placing of a number of additional hydrants and fire-alarm boxes.——Philadelphia, Pa.: The council's Committee on Water has agreed to report favorably on the ordinance, as amended, known as the Schuylkill Water Company's bill.——Lima, O.: The water-works committee has reported upon the necessity of an increase of the storage capacity at a cost of $125,000 to double the capacity, and has recommended that the necessary steps be taken to bring the matter before the people.——Sioux City, Mo.: The National Supply Company of Cincinnati, Ohio, has made three propositions to establish a temporary supply of water for this city. The figures ranged from $10,000 to $27,000, and were all referred to the water committee.——Quincy, Ill.: The projeet for this city to establish a separate water-works plant of its own is to be decided at a meeting of the common council, to be held this month.—— McGregor, Tex.: A water-works company has been organized, to put in a system of artesian water-works. Dr. W. R. Bailock is President, Charles R. Smith, Secretary,——Kansas City, Kan.: The city will in a few days vote on a proposition to issue bonds for providing a system of water-works.——Pasadena, Cal.: The Orange Grove Land and Water Association of Pasadena will vote, January 22, on the issue of $50,000 bonds for the improvement of their water-works system.——Milford, Del.: An organization of Wilmington business men will soon make a proposition to the town council of Milford to put up a complete system of water-works for the town, to be operated in connection with the electric light plant already in operation here. The proposed works will include the most improved machinery, duplicate boilers and pumps, large stand-pipe and heavy water-mains. They also propose to double the capacity of the electric light plant. ——Chambersburg, Pa.: A water committee has received plans and specifications for the pump which will furnish the power to lift the new water-supply to the reservoir. They will have copies of the specifications made, and submit them to the half dozen leading pump-makers in the county for bids. The pump will have a daily capacity of 1,500,000 gallons.——Grand Island, Neb.: The city engineer has reported upon the matter of extensions to the water-works system, and it is expected that they will be made.

BIDS AND CONTRACTS.

Cincinnati, O.: Sealed proposals will be received at the office of the Board of City Affairs until 12 o'clock noon on Wednesday, January 14, A. D. 1891, for one and two horizontal pumping engines, as follows: For one compound condensing engine having a capacity of six million gallons, in twenty-four hours, with a steam pressure of 110 pounds and a water pressure of 145 pounds. This engine to be delivered as a perfect low duty, but so arranged as hereafter to be made by additions to show a duty of one hundred million foot-pounds. Bidders will state in their proposals the cost of this engine delivered and erected in Cincinnati, O., as also the additional cost of the proposed additions for full duty, if ordered within twelve months of the date of this contract. Proposals will also name the cost of one additional engine of same size and full high duty, with the right to order same within one year from date of contracting for the first engine. Bidders will furnish full drawings and specifications with their proposals and also state their guarantee as to time of delivery and duty to be shown by test. Information will be furnished by Willis P. Tharp, Superintendent and Engineer Cincinnati water-works. Thomas G. Smith, President Board of City Affairs.——Lowell, Mass.: Sealed proposals, indorsed "Proposals for Pumping Engine," will be received at the office of the Lowell water-works, City Hall, until Friday, Jan. 16, for the construction, delivery and erection of a 10,000,000 gallon steam pumping engine for the city of Lowell, Mass., and at that time will be publicly opened and read. Specifications will be mailed upon application to water-works office, City Hall, Lowell, Mass. Other information may be obtained upon application to Lowell Water Works Office, or from George H. Barrus, M. E., 95 Milk St., Boston, Mass. John Stott, Miles F. Brennan, Edward W. Thomas, committee on new engine of Lowell Water Board.——Newport, Ky.: Sealed proposals, in triplicate, subject to usual conditions, will be received at this office until 11 o'clock A. M., Jan. 27, 1891, and then opened for construction at Fort Thomas, Ky., of a mess hall, and for the steam heating apparatus and plumbing for same. Envelopes containing proposals should be marked "Proposals for Mess Hall, etc.," and addressed to First Lieutenant R. B. Turner, 6th Infantry, A. A. Q. M., U. S. A.——Scranton, Pa.: Sealed proposals will be received at the Office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 7th day of January, 1891, for the iron beams, etc., for first floor, basement, columns, etc., for the U. S. Post-office, etc., building at Scranton, Pa., in accordance with drawing and specification, copies of which may be had on application at this office or the office of the Superintendent, at Scranton, Pa. Jas. H. Windrim, Supervising Architect.——Bombay, India: Proposals are wanted until February 16th for an experimental street-lighting plant. Address E. W. & R. Oliver, Corbet Court, London, England —— Brooklyn, N. Y.: The mayor opens bids Jan. 14: First, for the amount of the cost of the construction of the whole armory, including mason work and works, carpenter work and works, steam heating work and works, plumbing work and works, contained in the respective specifications; second, for the mason work and works contained in the mason's specifications for the construction of the Thirteenth Regiment armory; also for the carpenter work and works contained in the carpenter specification for the construction of the Thirteenth Regiment armory; also, for the iron work and works contained in the iron specification for the construction of the Thirteenth Regiment armory; also, for the steam heating work and works contained in the steam heating specification for the construction of the Thirteenth Regiment armory; also, for the plumbing work and works contained in the plumbing specification for the construction of the Thirteenth Regiment armory. Plans may be seen at the department of parks, city hall, and the office of the county clerk, hall of records. Specifications may be obtained and forms of proposals can be procured on application to the secretary of the mayor's office or Mayor Chaprim.—— Las Vegas, New Mexico: The Board of Trustees of the New Mexico Insane Asylum invites proposals for the erection of an insane asylum, until Jan. 20th, 1891. Said asylum is be built upon the "cottage system." Address Benigno Romero, Secretary.—— Kingston, Ont.: Sealed tenders will be received up to 6 o'clock P. M. on the 8th of January, 1891, for constructing and laying a 24-inch riveted steel suction pipe in Kingston harbor. Tenders to be addressed to the Chairman of the Committee on Water-works, Kingston, Ont., and endorsed "Tender for Suction Pipe." A copy of the specifications and full particulars can be obtained on application to the undersigned. T. O. Bolger, City Engineer.—— Troy, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock, P. M,, on the 13th day of January, 1891, for all the labor and materials required to put in place

complete the cast iron columns in basement, the stands for the first story columns, and the iron beams, girders, etc., for the first floor of the U. S. Post Office, Court House, etc., building, at Troy, N. Y., in accordance with the drawings and specifications, copies of which may be had on application at this office, or the office of the Superintendent at Troy, N. Y. Jas. H. Windrim, Supervising Architect.——Denver, Colorado: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 15th day of January, 1891, for all the labor and materials required for the plumbing, gas-piping, etc., for the United States court-house, post-office, etc., building at Denver, Colorado, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Denver, Colorado. Jas. H. Windrim, Supervising Architect.——Norfolk, Va.: Sealed proposals in duplicate, indorsed "Proposals for Electric Light Plant for the Norfolk Navy Yard," will be received until 12 o'clock, noon, on Tuesday, Jan. 13, 1891, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be furnished and plan of the yard may be examined upon application to the commandant of the Norfolk Navy Yard. N. H. Farquhar, Chief of Bureau.

Many different vegetable substances used as stimulating beverages, in widely different parts of the world, have been shown to contain caffeine as their active principle. Only one substitute for tobacco has, however, as yet been discovered. This is the leaves of the *Duboisia Hopwoodii*, a shrub growing in Australia, the leaves of which are chewed by the blacks in the same way and for the same purpose as tobacco is chewed. The leaves contain an alkaloid, *piturine*, which is said by certain chemists to be identical with nicotine, but more probably is only closely allied to it. Messrs. Langley and Dickinson have recently shown that the actions of nicotine and piturine are in every respect identical.

Death from burning is the most horrible death a man can suffer, and it is on accoont of the torture connected with it, rather than its frequency, that we urge so strongly the adoption of locomotive steam-heating systems. It is certain that in railway travel much more of life has been destroyed by poor ventilation of cars than by fire. The destruction is not immediate or obvious, but no person can breathe the air which is sometimes found in cars without having his life shortened thereby. On many roads the ventilation of cars is unwarrantably neglected, to the injury of their business as well as to the injury of the health of the passengers. That road which takes the lead in having conspicuously well-ventilated cars will deserve and will receive public commendation and an increase of patronage.—*Mass, Railroad Com.*

If you do not know what to give for a wedding present look over our advertisements and read the advertisement of the Eastman Company and note the suggestions for a Kodak.

A GREAT WAY TO MAKE MONEY.

Mr. Editor: The "help or the talents" plan of raising money for mission work was new to me, but our Mission Band each agreed to invest $3. Some always made wonderful investments, but I felt sure that I could not even double my "talent." During the week while reading your paper, I concluded to buy a plater. I sent $3 to W. H. Griffith, Zanesville, Ohio, got a plater and went to work plating spoons, knives, forks and jewelry, and in a month I had cleared $116.40, and done all the work after school; in three months I cleared $406. This is certainly a rare chance to make money with ease and rapidity. MARY BRITTEN.

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The berth reading lamp feature in the Pullman Sleeping Cars run on these lines is patented, and cannot be used by any other Railway Company. It is the great improvement of the age. Try it and be convinced.

For tickets, sleeping car reservations, and all information, apply at the Company's ticket office, 207-209 Clark street, or at its Passenger Station, Madison, Canal and Adams streets.

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Seven New Styles and Sizes

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Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

BURLINGTON ROUTE—BUT ONE NIGHT TO DENVER.

"The Burlington's Number One" daily vestibule express leaves Chicago at 1:00 p. m. and arrives at Denver at 6:30 p. m. the next day. Quicker time than by any other route. Direct connection with this train from Peoria. Additional express trains, making as quick time as those of any other road, from Chicago, St. Louis and Peoria to St. Paul, Minneapolis, Council Bluffs, Omaha, Cheyenne, Denver, Atchison, Kansas City, Houston and all other points West, Northwest and Southwest.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

DETROIT

Sanitary Supply Company,

MANUFACTURERS OF

SANITARY SUPPLIES,

SOLE MANUFACTURERS OF

The Patent Clean Sweep Non-Syphon

SEWER GAS TRAP.

Office, 37 First Street,

DETROIT, MICHIGAN.

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Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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IT IS the policy of the management of THE SANITARY NEWS to let it speak for itself. It is built to stand upon its own merits, and very seldom does it "blow its own horn." It does not need to; for it receives daily assurances of its wide recognition as the leading journal of its class. We have numerous letters from leading men in the different departments of applied sanitation, the professions, arts and trades relating thereto, of its standing in this regard. It has another interest, another mission, and that is, to serve the business interests in its line without lessening its usefulness as an exponent of advanced, practical sanitation. The manufacturers of and dealers in sanitary articles, material for building construction, plumbing, water-works and sewer building, lighting, heating, ventilation, etc., must reach the public in order to serve their own interest and supply the demands of the people. As a matter of information to the business world, and as a service to business men who wish to reach the public, we do not feel it amiss to give them some evidence of the value of THE SANITARY NEWS to them as an advertising medium. In the first place, this journal is a high-class weekly in all its departments and the interests it represents. It is a class paper, and goes direct to the very persons who use the material the manufacturers and dealers seek to dispose of. That it renders good service to advertisers is abundantly established by numerous letters we receive from time to time. One from Mr. B. A. Whitsett, Vice-President, N. A. M. P. for Alabama, located at Florence, says regarding the insertion of an advertisement in THE SANITARY NEWS: "I have found what I advertised for. Received 210 letters in answer." This is from that far section of the country. Another from the far Northeast received 217 letters, from an advertisement. Another in the Northwest received 238 letters, from an insertion. These letters, in all cases, were received in a short time after publication. The number received since we do not know of. This is enough, however, to show the enterprising manufacturer or dealer that THE SANITARY NEWS is a very valuable and satisfactory medium through which to solicit trade. THE SANITARY NEWS does not only reach a wide circle of consumers desired to be reached, but it is with them a journal of high standing, authority and respectability—all important facts which advertisers cannot overlook.

WE always expect hustlers among the advertisers of patent medicines, but there is one down in Florida who is clearly in the lead. He advertises to give a warranty deed to a town lot in Florida to each purchaser of a dollar bottle of medicine. The fellow probably means an 8x3 lot in the "city of the dead."

THE cracking of old chestnuts regarding the plumbing trade has become a flat, stale and unprofitable business, and the press generally is becoming to view the question of sanitation as an important one. The space given this matter at present is a strong indication that there is a demand for such information; for the press is quick and correct in determining the sense of the public in regard to matters for publication.

SOME time since we made mention of a suit for libel entered by Radam, of the "microbe-killer" fame, against the *Druggists' Circular*, for a big pile of money. The progress of the suit is thus given by the journal: "It will be remembered that William Radam, of the Radam Microbe-Killer Company, entered suit for libel against the *Druggists' Circular*, claiming damages of $200,000, because this paper produced an analysis of the 'microbe-killer,' accompanied by some comments. Before answering the complaint, the *Circular* made application to the Supreme Court to have Radam place on file the names and addresses of his agents and witnesses in the case, and to state the nature of his connection with the company. Judge Andrews has granted the application, and Radam will have to produce the desired answer in court. While this does not settle the case, the action is a decided advantage to the *Druggists' Circular*. Information is, however, still solicited from the trade at large as to the merits of this proprietary article, in order to have more confirmatory evidence that it has produced serious results, when the time for the trial arrives."

UNDER the title of "A Little Knowledge," the *Druggists' Circular* says: It was stated some time since in a foreign journal that the well-known method of clearing water by the use of alum had been adopted by the French troops in Tonquin, and that since the introduction of this method the soldiers had been nearly free from dysentery.

As the water in many eastern countries is apt to be contaminated with disease-germs, on account of the total lack of sanitary precautions, the custom is to boil it before using internally; but the military have not found it convenient, it is said, to always do this, and it is thought that the precipitate formed by the alum in many waters takes down with it any microbes which may be present.

This paragraph, in "going the rounds," has fallen into the hands of a contemporary devoted to the grocery business, and the editor, in reprinting it, jumps to the conclusion that "this does not look as if alum was such a deadly poison as some of the manufacturers of baking-powder represent."

If, in the first place, alum removes germs in the manner indicated,—a statement the accuracy of which we greatly doubt,—the

fact that the soldiers do not get the dysentery after using such water proves nothing regarding the physiological action of the alum itself. The note referred to shows that in certain kinds of water the alum is wholly removed by the act of precipitation, both the base and the acid radicle entering into other combinations. There, of course, is usually some excess of alum used, but its disagreeable taste would lead to reducing it to a minimum.

Alum, like many other drugs, causes but little disturbance in the animal economy when taken in small doses at long intervals, but by frequent repetition it is likely to produce unlooked-for results, the cause of which is not recognized when they appear. If any manufacturer of baking-powder pictures the alum which he does not use, and which his neighbor does, as a "deadly poison," he is rather straining language to emphasize a point Yet, alum, while not deadly according to the usual understanding of the word, is poisonous enough to affect the health, and in this way may finally prove as "deadly" as any other kind of poison.

We have, from time to time, called attention to the sanitary code of Italy, and the improvements and reforms being made recently in that country. A complete sanitary system was organized in that country about two years ago, and the results are important in demonstrating the value of sanitation. In 1888, it appears from a statement recently published, there were 442,112 cases of the seven principal diseases—small-pox, measles, scarlet fever, diphtheria, typhoid fever, typhus fever and puerperal fever; while in 1889, from the same diseases, there were only 293,107 cases, or nearly 150,000 less than in 1888. This means, with the usual or average mortality from these diseases, a saving of about 12,000 lives, besides the enormous amount of sickness indicated—a pretty good showing for the first year. The following is a tabulated statement of the number of cases of each of the two years:

	1888.	*1889.*
Small-pox	63,632 cases.	39,004 cases.
Measles	220,953 "	130,961 "
Scarlet fever	44,419 "	30,192 "
Diphtheria	41,742 "	28,399 "
Typhoid fever	59,526 "	54,865 "
Typhus fever	2,831 "	2,206 "
Puerperal fever	9,019 "	7,480 "
Total	442,122	293,107

All those who are not convinced of the great value of sanitation should study these figures.

NOTES AND NEWS.

Ten thousand dollars worth of oleomargarine has been seized in Pittsburg stores, where it was being sold as butter.

Printing can be copied on any paper of an absorbent nature by moistening the surface of the latter with a weak solution of acetate of iron, and using an ordinary copying press.

It has been discovered that glass is capable of being turned into fine cloth, which can be worn without the slightest discomfiture next to the skin.

It is proposed to remove incrustation from boiler tubes by temporarily enlarging the tubes by means of a tool having opposite projecting rolls traveling through a spiral.

Faraday's definition that "gas is the vapor of a liquid at a temperature above the boiling point of that liquid" holds good today, the lapse of time having shown no necessity for altering it.

An English engineer suggests an annual competition of firemen, the most successful to be suitably rewarded, as a stimulus to firemen to do more thorough and scientific firing.

Cloth is now made of wood. Strips of fine grained timber are crushed between rollers, the filaments carded in the usual manner with textiles into parallel lines and spun into thread, from which the cloth is woven.

Thermometers made of Jena glass can be made serviceable for measuring temperatures as high as 450 deg. C., according to *Zeitschrift fur Instrumentenkunde*, if the tube above the mercury is filled witb nitrogen, so that the quick-silver at increasing heat is under a steadily increasing pressure.

An old Swedish woman, living near Lapeer, Mich., recently gave birth to her first child after having been married 38 years. The woman claims to be 60 years of age. The baby, a boy, weighed only 3 pounds at birth and was shrivelled, but otherwise healthy. The woman says that she was born when her mother was 52 years of age, and that her grandmother gave birth to twins at the age of 63.

Chantemesse reports a case of typhoid fever with relapses extending over five months, says the Brooklyn *Medical Journal*. Orloff has published a case in which a pure culture of the typhoid bacillus was obtained from an osteo-myelitic abscess nine months after the beginning of the affection. Achalme has reported a similar case. These cases are rare, but they teach the possibility of prolonged infection in typhoid.

A German inventor proposes to make boots with stone soles. He mixes with a waterproof glue a suitable quantity of clean quartz sand, which is spread on the thin leather sole employed as a foundation. These quartz soles are said to be flexible and almost indestructible, while they enable the wearer to walk safely over slippery roads.

De Rosa (*Giorn. Internaz. delle Scienze Med.*, 1890, Nr. 3) believes that in salicylic acid we have a powerful prophylactic against scarlatina, for of sixty-six children who were exposed to the contagion of scarlatina, and who took daily 0.10 to 0.30 gramme (1½ to 4½ grains) of salicylic acid, sixty-three escaped tqe disease. As De Rosa emphatically remarks, this result may be expected only when the salicyic acid is given early, in sufficient daily doses, and is continued as long as there is any danger of infection.

An interesting improvement in grate construction has come to light. The device simply consists of a damper so placed in the fire-place as to readily control the draft. This damper is placed in such a way that it may be swung in a vertical or horizontal position in the arc of a halfcircle. When placed in a vertical position it acts as a blower, and either coke or coal can be used. The damper is operated by a handle on the outside of the grate.

The *Medical World* says if you want a sure, speedy action from your drugs as if you gave them hypodermically, administer them in hot water; one-half the dose will have the effect. The reason is obvious. If the dose be given in hot water it is quickly absorbed, and the force of the drug thrown upon the system at once. Few people realize how long the dose will remain in the stomach if that viscus be chilled. Beaumont found that a glass of ice water stopped digestion for one hour. This method of administration is particularly suitable for the vegetable preparations, opiates, etc.

In order that our readers may recognize a blush when they see one, we give its definition by J. L. Rollins, M. D., of Auburn, Cal.: A blush is a temporary erythema and calorific effulgence physiognomy, ætiologised by the perceptiveness of the sensorium when in a predicament of unequilibrity from a sense of shame, anger, etc., eventuating in a paresis of the vasomotor nervous filaments of the facial capial capillaries; whereby being divested of their elasticity, are suffused with radiant, ærated, compound-nutritive circulating liquid, emanating from an intimidated præcordia.

Dr. William A. Hammond warns against overheated apartments. He says: "An overheated apartment always enervates its occupants. It is no uncommon thing to find rooms heated in winter by an underground furnace up to 90 deg. Fights and murders are more numerous in hot than cold weather, and the artificially heated air that rushes into our rooms, deprived as it is of its natural moisture by the baking it has undergone, is even more productive of vicious passions. It is no surprising circumstance, therefore, to find a woman who swelters all day in such a temperature, and adds to it at night by superfluous bed clothing, cross and disagreeable from little every day troubles that would scarcely ruffle her temper if she kept her rooms at 65 deg., and opened her windows now and then."

Clean houses.—At a meeting of the National Health Society, at the Parks Museum of Hygiene, in London, recently, Sir Robert Rawlinson presiding, a paper written by Mrs. Priestly was read on some "Unseen Dangers in the Home." She advocated the periodical inspection of cellars, their scrupulous cleanliness and ample ventilation. There was often a plague-spot in the cellars

and basements, she thought, of our houses which was never thought of, and which gave forth insidious germs, destructive to life when once they found a suitable soil inside the house or the human body. The house should be treated as a faithful servant. It would either be a friend or enemy, according to amount of consideration or neglect it received. Let them give it daily care, wash and tend it, avoid obscuring the light by covering the windows with too numerous folds of lace, drawn silk blinds, and heavy curtains, which was to choke the house by pressing on its windpipe. The windows should be opened wide every morning, so that the house could have an air bath; the air should be cleaned if possible, and care should be taken to drink clean water by having the filters cleaned regularly, and, last of all, court and welcome the sunshine.

Less than ten years ago, the *Northwestern Builder* remarks, Memphis, Tenn., seemed to be a doomed city. The population had shrunk twenty per cent in a few years, and real estate had decreased in value, all because the city was scourged by disease. The panic-stricken people, looking upon the place as doomed, had surrendered the municipal charter. But about 1880 a complete drainage system was constructed, and with its completion health and prosperity commenced to return. To-day the Memphis *Appeal* estimates that in the last twelve months $5,000,000 have been put into public works there by foreign and local investors, a bridge across the Mississippi is under construction, new banks, club buildings, a union depot, etc., are being built, the cotton receipts have about doubled on those of nine years ago, and the population has increased in nearly the same proportion—all because it was finally realized that, to prosper, a city must, first of all, use those precautions against epidemics and diseases which sanitary science has placed at its disposal, and render its surroundings as healthful and inviting as they can be made. This done, ordinary business energy and push will do the rest, as the present prosperity of Memphis proves. There, drainage saved a dying city.

THE TECHNICAL EDUCATION OF ARCHITECTS.*

Passing now to the subjects connected with architecture as an art, the instruction given in the Architectural A or art class takes up the subjects required for the art side of the examinations, but, as in the case of the science subjects, they must be supplemented by drawing and measuring existing buildings, and by other study. In order to enter for the intermediate examination, the student has to do an amount of preliminary work which will be of great value in making him familiar with the forms, features and ornaments of Classic and of Gothic art, and it will usually be best for him to do that in the office where he is a pupil. Here, in the class-room, the history of the art is pursued, beginning with Greek and the styles on which Greek is founded, and then taking up successively Roman, Basilican, Byzantine, Romanesque, Gothic, Renaissance and modern art, and, in addition to the history, pointing out the distinctive qualities and features of each, and some of the principles of design which were dominant in the successive periods. It has been my custom, and I intend to follow it in the coming session, to take Greek architecture more in detail than any other part of the course, partly on account of the great importance of the subject, as at the root of almost all architecture since, and partly from the circumstance that it lies in smaller compass, and it better admits of a somewhat thorough examination than any other style.

Drawing, though left to a part of the lecture, is a subject of which the importance cannot be overrated. As I have often pointed out before, drawing in three ways is the servant of the architect. He first learns to know all the forms, features and details of buildings by drawing them, and learns how buildings are planned and contrived by making plans and working-drawings; in short, it is through the use of the pencil that he fills his mind, hand and eye with the material out of which any designs of his own must be made. Secondly, the pencil is the instrument which assists—nay, enables—the architect to design his buildings and their details. The most original mind could not go far if prohibited from working, pencil in hand, and required to think out the entire idea of a proposed building before putting a line on paper. Thirdly, the pencil enables the architect to prescribe what to do with the workmen who will be engaged erecting his building, or preparing portions of the fittings of it so precisely that they fall into their place exactly, and to make clear to his clients what the proposed buildings will be like. Without good, exact and complete drawings, the modern rapid method of erecting buildings would be simply impossible; and though small and plain structures can be built—as probably English parish churches were previous to the fifteenth century—practically without drawings, the mode of procedure and the nature of the buildings were quite different from what we have to deal with.

In order to be a good architectural draughtsman, with cultivated eye and hand, a man must learn something of what is called freehand drawing, and it is best that he should begin with it. He who, when he commences his acquaintance with drawing, has a square and rule and compasses put into his hands is never likely to go alone without them, and is never likely to learn to use them as an artist should. A good draughtsman is made by mastering the drawing of the human figure from the flat and the round, and where practicable from the life, and by then being introduced to the use of drawing instruments; and he deserves the name of "good" when he can work with the instruments in his hand as freely and unfettered as if he were simply using chalk, or pencil, or etching-pen. In laying out the course for a student acquiring technical education at a college preparatory to becoming the pupil of a practicing architect, to pursue the wisest plan, in many cases, would be to devote whatever time can be spared from other subjects to figure-drawing, and to postpone all geometrical drawing and the study of architectural features—such, for example, as the orders—till his pupilage. I hardly need say that for this work there are facilities in the Slade School, forming part of this college, inferior to no art-school in London. Where the pupil is already a good draughtsman, or, in some cases, where he has not the facilities in the office where he is articled for pursuing the kind of work, I believe a school of architectural drawing here would be of service, and I do not doubt the feasibility of establishing one as soon as a sufficient field of usefulness seems to open for it.

This additional consideration must, however, be borne in mind: that the study of drawing is calculated not merely to make a man a draughtsman, but to promote his becoming an artist. Some small spark, at least, of artist's knowledge, feeling and skill must be part of the architect's composition, or he will be but a poor sort of an architect, however elaborately trained; and it is to work in the art-school that we must partly look for rousing any germs of artistic enthusiasm there may be for opening a man's eyes so that he may know how to see the beauties of nature, and how to appreciate the art of good pictures, statues or buildings. And among auxiliaries for helping to learn the nature of art let me include the lectures given here by our newly-appointed lecturer on applied art, Mr. Stannus. No architectural student will regret attending them, and I doubt if any more interesting and stimulating instruction can be obtained by a student anxious not merely to make himself familiar with ornament as used in architecture, but to understand the reason why good ornament is good, and bad is bad; in short, the principles which underlie all successful applications of art to industry—among which applications architecture holds the foremost place. In speaking earlier of a liberal education, I spoke of fine-art training as calculated to give that liberal quality to an architect's education which it must not be without. Here I refer to it as an essential. Any other kind of accomplishment is desirable, but something of the artist he must be if he is not to be a failure. Here, then, time and attention may be wisely bestowed, otherwise the scientific and practical training may outweigh or smother the artistic sense, which often is not at first at all vigorous, and in many respects needs careful fostering.

I ought not to omit, and at this point ought to take up, the subject of design in architecture, did time permit; but a few sessions ago I devoted a lecture similar to this to an examination of the question, covered by the following subject: "Learniug to Design Buildings;" and, as that was printed in the professional journals of the time, I must refer you to them if you wish to see in detail what I have to say on that subject; and I will ask any who may feel interested in this lecture to be good enough to turn up the reports of that one and read them. Briefly I may point out here, however,

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that designs can only be made by persons who have in their possession material out of which they are made, and know how to use it. To put this truism into other words, the first essential in designing buildings is knowledge of buildings—of their plan, of their structure, of their intention, uses and qualities. The next is a knowledge of the architectural features which are put together in forming a design—a knowledge to be only gained by drawing them, and to a considerable extent only by drawing them from actual existing examples. Thirdly, some familiarity with the principles of design or composition to be detected in good buildings; and lastly, repeated and persevering effort. If there is any branch of knowledge and of skill in which it is more true than usual that practice makes perfect, I think it is in the designing of buildings. If you compare the early-executed works of Sir Charles Barry with his latest masterpieces, you will see how far he was when he began from meriting the distinction which has often been accorded to him of being the foremost architect in Europe of his time; and his great genius was only brought out by unwearied practice in using the vast store of architectural knowledge which, during his long period of pupilage and of study abroad, he had accumulated.

There remains one branch of architectural technology to consider—a branch of which much can be learned in the lecture-room, though the nature of it is essentially practical. I allude to professional practice. This topic forms the subject of examination at the institute, and is one on which it is peculiarly advantageous for a practitioner to be forewarned, quite apart from examinations. A course of lectures on "Professional Practice" is given by me in this college. I do not recommend students who are going through such a preliminary technical course as I have suggested may, with advantage, be taken before entering an office to include this subject. The course is intended rather for men who have had some practical training and are preparing for the final institute examination, or desire to qualify as district surveyors, or at least wish to understand what is going on in the practice of the office where they are, or to prepare themselves for entering practice on their own account. The entire routine of the professional conduct of building operations from the architect's point of view, and those points in which law comes most into play, such as the Acts of Parliament regulating buildings, and rights of light and air, form the subjects of these lectures, which also include a notice of dangerous and ruinous structures, and the precautions to take in dealing with them. These lectures, I hope, may enable some of my students to profit by other men's experience, instead of having to win the whole of their experimental knowledge of practice for themselves.

It is now time briefly to recapitulate the course on which we have traveled, preparatory to drawing this lecture to a close. After referring to the now completed series of institute examinations as pointing out to us the subject of technical education for architects, we divided a profetsional man's education, and looked at its initial, liberal, technical and practical sides; and, after glancing at the initial and its bearing upon the preliminary examination, we considered at some length the nature of a liberal education, and how a man who originally has not enjoyed many advantages may improve and expand his mind by suitable studies. A notice of practical education led to a few words on the subject of pupilage in the architectural profession, and we were then left to consider technical education in connection with the tests involved in the intermediate and final examinations at the institutes. The scheme for technical education now under the consideration of the Architectural Association appeared here to claim special notice, and if, as an old member and former officer of the association, I ventured on some remarks that were critical in their nature, I trust it will be understood that they were not dictated by any desire to find fault,—far less to oppose,—but as a contribution to the discussion of a scheme which must be very thoroughly sifted.

I then considered the course which a different class of candidates for success in these examinations, especially in the intermediate, can follow, and I pointed out the large provision of skilled instruction in the subjects on which the technical studies of an architectural student must chiefly turn which exists at this college, and of which a student whose friends can send him here for a session before he is articled—or, let me add, his master after he is articled—cannot do better than avail himself. This includes, of course, a brief resume of the work which those who go through with me the courses that are soon to begin will take up, for a fuller statement of which work I must refer you to the printed prospectus; and I beg here to remind you that the first lectures of each course will be open to you free, so that those who desire to do so can attend one or two lectures to see if the sort of information given is what they desire. I have, however, very little doubt that most of the students who go through the courses this session will not be in the position of the imaginary student whose course of study I have sketched; they will rather be pupils or assistants in architects' offices desirous of making the most of time. I can only say that any or all of you will be welcome in that character. It has hitherto been almost entirely from architects' pupils that these classes have been recruited, and the hour of meeting—a very convenient one for the professor—has been fixed and still retained at six, as being likely to suit the majority of such pupils. I have in this paper sketched what I believe would be the most useful programme for the education of an architect; but it is not the programme so much as the quality of the teaching, and, let me add, the quality of the learning, which makes education of any sort a success. You, gentlemen, have arrived at a period when, to a large extent, a man's future is in his own hands more than in those of any other persons in any way concerned. And do not let this evening's engagement lead you to put too high a value on any system of education *per se*. A good system is a good thing, as it affords a good teacher and a good learner the best scope for their respective shares in the great work of education, but that is all. A resolute, intelligent and persevering student can manage to extract a vast amount of knowledge if only he can get at any person any class or any book where the knowledge exists, even if proceeding according to a very imperfect method; and a good teacher is, to a very large extent, independent of any exact scheme, for he involuntarily steps over the boundaries of a cramped one and straightens the irregularities of an ill-considered one. I do not, however, wish to be understood as apologizing for the programme here as either cramped or ill-considered; on the contrary, no pains have been spared to make it comprehensive, and a great deal of consideration has been bestowed upon the question what to include, and in what order and by what methods to take up the different subjects. Of the professor it is not for me to say anything except to claim that he has had a long experience in his share of the work, and to assure you that he has a very genuine sympathy with you in your share, and a hearty desire to be of as much service to you as possible.

RELATION OF GROUND-WATER TO DISEASE.

At the opening of the Royal Meteorological Society, Mr. Baldwin Latham, C. E., the President, delivered an address on the above subject, of which the following is abstracted from *The Builder*, of London:

The pages of history show that when the ground-waters of our own and other countries have arrived at a considerable degree of lowness, as evidenced by the failure of springs and the drying up of rivers, such periods have always been accompanied or followed by epidemic disease. In all probability ground-water in itself, except under conditions where it is liable to pollution, has no material effect in producing or spreading disease. As a rule, it is only in those places in which there has been a considerable amount of impurity stored in the soil that diseases become manifest, and the most common modes by which diseases are, in all probability, disseminated, are by means of the water-supplies drawn from the ground, or by the admission of ground-air into the habitations of the people. It is found that the periods of low and high water mark those epochs when certain organic changes are taking place in the impurities stored in the ground, which ultimately become the cause and lead to the spread of disease. Mr. Latham defines "ground-water" as all water found in the surface soil of the earth's crust, except such as may be in combination with the materials forming the crust of the earth. It is usually derived from rainfall by percolation, and it is also produced by condensation. In dry countries, ground water is principally supplied by the infiltration from rivers, as, for example, in the Delta of the Nile.

The absence of water passing into the ground for a long period naturally leads to the lowering of the free ground-water-line, and may lead to the drying of the ground above the water-line; and it

is curious to note, with reference to small-pox, that the periods marking the epochs of this disease are those in which there has been a long absence of percolation, and a consequent drying of the graund preceding such epidemics. On the other hand, small-pox is unknown at such periods as when the ground has never been allowed to dry, or is receiving moisture by condensation or capillarity.

The study of underground water shows that certain diseases are more rife when water is high in the ground, and others when the water is low. The conditions that bring about and accompany low water, however, have by far the most potential influence on health, as all low-water years are, without exception, unhealthy. As a rule, the years of high water are usually healthy, except, as often happens, when high water follows immediately upon marked low water, when on the rise of water an unhealthy period invariably follows.

Mr. Latham has found that those districts which draw their water-supplies direct from the ground are usually more subject to epidemics and disease than those districts in which the water-supply is drawn from rivers supplied from more extended areas, or from sources not liable to underground pollution. In the case of Croydon, one portion of the district (under three-fourths) is supplied with water taken direct from the ground, whilst the remaining portion is supplied with water from the river Thames. It is curious to note that even so recently as 1885 the zymotic death-rate in the districts supplied with underground water was twice as great as in that part of the district supplied from the Thames; and in this particular year forty-one deaths from small-pox occurred in the district, not one of which was recorded outside the district supplied by the underground water.

Mr. Latham, in his address, dealt largely with zymotic diseases as affected by ground-water, and showed that cholera ordinarily breaks out when there is the least ground-water; a high air and ground temperature is also necessary for its development, and, as a rule, the low-lying districts are favorable to the production of these high temperatures. Small-pox is almost always preceded by a long period of dryness of the ground, as measured by the absence of percolation. Typhoid fever is most prevalent after a dry period, and when the first wetting of the ground or percolation from any cause takes place. The condition essential to the development of diphtheria is a damp state of the ground marked by extreme sensitiveness to percolation of rain. Scarlet fever follows the state of the dryness of the ground which is essential to its development, and it occurs in the percolation period. The conditions that precede small-pox are those favorable for the development of scarlet fever, and, like small-pox, the dampness of the ground for any considerable period, in any particular locality, may check its development or render it less virulent, and it is most rife in low-water years. Measles are least prevalent at the low-water periods, and mostly rife at and near high-water periods. Whooping-cough follows the percolation period in its incidence, increasing with percolation, and diminishing as the waters in the ground subside. Diarrhœa is generally more prevalent in a low-water year than in other years; that is, with a very much colder temperature in a low-water year, there is a very much higher death-rate from this disease.

Mr. Latham finds that the general death-rate of a district is amenable to the state of the ground-water, years of drought and low-water being always the most unhealthy.

STERILIZED MILK.

So-called "sterilized milk" by no means always deserves its name, in some cases being much fuller of germs than ordinary unboiled milk fresh from the cow. Herr Kohlmann, of Leipsic, on subjecting two specimens of milk sold as sterilized to examination, found that one of them really was so, no germs being discoverable; while the other specimen contained 350,000 germs per cubic centimetre. For the purpose of comparison other examinations were made, and it was found that a sample of fresh milk bought in the street contained about 160,000 germs per cubic centimetre—that is to say, less than half the number in the second sample of so-called sterilized milk. Milk boiled in the kitchen contained 158 germs per cubic centimeter; distilled water kept in an open vessel, 430; water-works water, 1,064; and water from the Hofbrunnen, 12,000. Herr Kohlmann suggests that the failure of whatever process was used to sterilize the milk may have been due either to water having been mixed with the milk before the process was commenced, or perhaps to to long a time having been allowed to elapse between milking and sterilizing. This last point exercises a very great effect, as is shown by Freudenreich's observations. He found that milk which when received contained only 9,300 germs to the cubic centimetre, after being kept for three hours at 60 deg. F. contained 10,000; after six hours 250,000; and after twenty-four hours no less than 5,700,000. It would therefore appear that our knowledge of the conditions under which milk may be readily sterilized is at present somewhat insufficient, and that reports of the results of feeding of infants with milk which is reputed to be sterilized must always be received with a good deal of skepticism unless specimens of the milk have frequently been examined by a competent person.—*The Lancet.*

BOSTON'S REVISED BUILDING REGULATIONS.

From the recently issued report to the mayor and to the city council of the city of Boston, of the commissioners appointed to revise the building laws of the city, the following is extracted by the *Engineering Record*:

"Your commission have endeavored to obtain all the information possible upon the question submitted to them. They have for the purpose examined the existing building laws of all the principal cities in this country, as well as those of London and Paris; one member of the commission having, at his own expense, visited the two latter cities for the purpose of obtaining information. With the same object in view, the commission prepared an abstract of all the laws and ordinances relating to the subject, in a form more clearly and easily read than the printed compendium of the laws, and sent it for criitcism and suggestions to such persons as they thought would, from professional or official exporience, be able to make suggestions on the subject.

"The laws relating to the construction and use of buildings naturally divided themselves into two parts:

"1st. Provisions that every building newly built, altered or reconstructed, shall be safe, reasonably fireproof and wholesome.

"2nd. Provisions intended to insure the maintenance of these conditions afterward.

"We understand our duty to be, under the order, to prepare laws regulating the construction or alteration of buildings, and that it is not our duty to prepare all the needful regulations for their maintenance and police inspection afterwards.

"As regards danger from fire, it is a police or fireward duty to see that the doors of all engine rooms and iron shutters of all buildings, where shutters are required, are closed every night; to see that hotels are furnished with red lights; automatic alarms, in good order, and a proper number of watchmen; to see that all fire-escapes are unobstructed, and that age and want of care has not rendered them insecure or unsafe; and so on, with a great number of details.

"As to health; it is a health inspector's duty to see that garbage and filthy water is not allowed to accumulate; to see that tenements are not overcrowded; and are kept clean and well ventilated; that the plumbing is in order; and so on, with many more details.

"A part of these duties is now performed, as far as is practicable, by the inspectors of buildings, a part by the inspectors of health, and a part by the police; but none of these departments have a sufficient force for a thorough doing of the work; and, though it is without our province, as we conceive, to consider this subject, we venture to suggest that it would be well in both departments the number of the inspectors should be increased, and should be required to make periodical reports in writing as to every building, without exception, with the addition, perhaps, of a detail of police, such as exists in New York.

"The commission have less difficulty in determining how fires may be prevented, than deciding what restrictions are reasonable, as not so enhancing the cost of buildings as to make rents unreasonable, restrict building, and obstruct business. On the part of the owners it must be admitted that the indifference on the subject of fire is almost universal. Official suggestions for rendering buildings safe from fire are usually resisted as far as possible. Willing compliance is rare. Most, if not all, owners of

real estate have their property fully insured. Large commissions are paid to insurance agents. Competition to furnish insurance is active and eager, and there is no risk that does not find a taker. Under these circumstances, in American cities, where the use of real estate is constantly shifting, and old buildings are needed for new uses, it is literally true, that almost every real estate owner is thankful to have his building destroyed by fire if he is fully insured. If insurance companies were prohibited from paying more than 75 per cent of any loss, or if, as in Paris, the party on whose premises the fire originated was liable to his neighbors for all the damage caused, it would, no doubt, load to very much greater safety in building, and very much care in the protection of buildings, by better construction, and by provisions of watchmen and water for immediate use.

"The loss by fire in the city of Boston has been, during the last thirty years, in round numbers $100,000,000. With interest added upon the sums of money lost from the date of loss, the sum total more than equals the present valuation of all the taxable buildings in the city of Boston, which is $244,000,000 (1889). If the amounts paid for insurance and for the maintenance of the fire department during the same period were added, with interest, the total amount would very far exceed the value of all the buildings in Boston to-day, public and private. If the money which has been lost by fire and expended in insurance premiums, and in the maintenance of the fire department, should be paid into the city treasury to-day, with interest, there would be more than enough to duplicate every building in Boston and pay the city debt. There would probably be enough left to build anew every building in Boston, making them all as nearly fire-proof as the wit of man and money can make a building. The rates of insurance in Boston have so wide a range that it is very difficult, if not wholly impossible, to make an accurate estimate, but one-quarter of one per cent on $254,000,000, total valuation of the taxable buildings in Boston, would be a conservative figure. One-quarter of one per cent on $244,000,000 is $610,000. The cost of maintaining the fire department and fire alarm system for the year 1888-89 was $853,000, making a cost of $3.49 for every $1,000 worth of taxable buildings protected by the fire department—about one-quarter of the lawful rate of taxation upon all property. Add to this $3.50, the cost of the fire department, the estimated cost of insurance, $2.50, and we find that the combined expense of insurance is $6 per thousand—six-tenths of one per cent. It must be borne in mind that incidental protection is given by the fire department to furniture, merchandise, and other personal property, but there is no adequate means of ascertaining the value of this. The figures, however, are equally serviceable for the purpose of comparison; and such comparisons, though often dangerous, and to some extent misleading, are very instructive. For instance, the cost of maintaining the fire department of London, which has ten times the population of Boston, was, last year, only £133,300 —about $200,000 less than the cost of the fire department here. Five hundred and ninety-one firemen were employed, all told, and the force is being increased at the present time at an expense of $75,000 more a year to 707 men, which is almost precisely the number now on the rolls of the Boston fire department, which, all hands included, comes to 700 men.

"Our American methods are no doubt brought to much greater perfection than those abroad, but, although London is in great part very badly constructed, the rate of insurance is only 75 cents per thousand. In Paris, the best rate of ordinary insurance is one per cent—ten centimes per thousand francs. On furniture the rate is 75 cents per thousand. To cover the liability of the tenant to his landlord in case of fire, his rate is 20 centimes for 1,000 francs. To cover the risk of responsibility to a neighbor it is ten centimes per thousand francs, and yet a certain insurance company, the particulars of which were given us confidentially, has found the business of insurance at these rates so profitable, that the original capital of $80,000 has now a market value of $12,000,000. The original cost of a share was 1,000 francs, and the usual dividend is 1,400 francs per share. The immunity from fire in Paris is, no doubt, due largely to the cheapness of incombustible material, and the expense of wood; partly to the way in which the city is laid out with wide streets, and partly to the building laws, especially those which restrict the height of buildings, no private building in Paris being allowed to be more than twenty meters high in any event. The height of buildings is further restricted in proportion to the width of the street, beside which, great vigilance is caused by the existing law. The occupant of an apartment in which a fire originates is liable to the landlord, and also to his neighbors if any damage results to them. As to the liability of the landlord, the burden of the proof is upon the tenant to show that he is not in fault. As to the liability to his neighbors, the burden of the proof is upon the neighbor, to show that the fire was due to the negligence or fault of the occupant. Defective construction makes the owner liable to the owners of other property. These liabilities, known as landlords' risks and neighbors' risks, are the subjects of insurance; but as there is no limit to the liability, great vigilance is practiced. The construction is largely of stone and plaster, wood being used only for finish and framing of partitions where it forms the skeleton of a mass of plaster, so that fires are not rapid or destructive. The population of Paris is five times that of Boston. There are twelve steam fire engines and, although the department was called to 2,847 fires during the last department year, the steam engines were used in only twenty-four cases. In one case only were four engines used; in three cases, three engines only; in four cases, two engines only, and in the remaining fifteen cases, only one engine. On the other hand, the Regiment of Sapeurs Pompiers, which is organized in military fashion, amounts, including officers, to 1,774 men. Most of the work is done with petty apparatus.

"The building laws of London are in many ways defective, and, as a whole, not nearly as good as ours. There are very few high buildings, although there is no legal prohibition of them, and more of them are now in process of erection. Under these circumstances, the economy and efficiency of the fire department is remarkable."

THE BACK-AIR TRAP VENT.

St. Cloud, Minn., January 5, 1891.—Editor of The Sanitary News: W. A. K. seems not to be aware of the somewhat recent experiments with traps by Col. Geo. E. Waring, Jr., and J. Pickering Putnam, the most eminent authority probably in this country. They found, by many severe tests, that the back-air pipe did not materially lessen the liability of traps to have their seals broken by syphonage, and that, unless the back-air pipe was much shorter than can often be used in plumbing practice, it did not lessen the liability at all. Col. Waring states that he considers the danger to the water-seal greater from the evaporation caused by an active circulation of air, directly in contact with the water, than from syphonage. I know of but one proper way of connecting the back-air pipe with the trap, and that is for it to rise directly from the crown, which brings it in close proximity to the seal. I have known the seals in traps to be broken by evaporation in one week's time, when fixtures were not used. John F. Jerrard.

A SUNNY HOUSE.

Mr. Wingate in an article in the *Building and Loan News* says: "No element is more important to consider in selecting a home. Its presence is indispensable to health and comfort; its absence is a sure aid for gloom and disease. Saint Bernard exhorted his disciples to live in valleys so that they would be often induced by the narrowness of the horizon to look up to heaven. Such an abiding place, whatever may be its effect upon the spiritual nature, however, is calculated to develop consumption and catarrh, and, with reference to physical well being, should be avoided.

The potent influences of sunlight upon health can hardly be exaggerated. Dr. Weir Mitchell, in his interesting researches on snake poisons, found that the poisons of the deadly cobra, if exposed to sunlight for a brief time, became harmless. Prof. Huxley has shown that yeast increases indefinitely in volume amid darkness and damp, while in sunlight just the reverse is the case. Sunless houses are the creators of sickness. The prevalence of goitre in Siberia, which attacks twelve and often twenty-five per cent of the people in some villages, is ascribed to the accumulation of filth in deep, narrow valleys and the habit of Russian peasants of keeping their houses tightly closed.

Yet it is amazing to find so many houses built in utter disregard of the necessity of sunlight. There are hundreds of city homes, expensively built and occupied by wealthy tenants, which

are as deficient in light as an average tenement house. Yards barely ten feet deep are common, especially with corner houses, and scores of families of ample means and refinement seem content to live in rooms which have no outlook beyond a blank wall or the rear windows of their neighbors. The inconvenience and destruction of comfort and privacy caused by this deprivation are patent, but a more serious consequence is the injury to health. Dr. A. N. Bell, in his recent work on "Climatology," says: "Free access of light favors nutrition and regularity of development, and contributes to beautify the countenance, while deficiency of light is usually characterized by ugliness, rickets and deformity, and is a fruitful source of scrofula and consumption in any climate." This statement, we may add, is corroborrated by a fact noticed by Dr. Hammond, that "various experiments demonstrate that the action of light is of benefit in many conditions, anæmia, chlorosis and phthisis being among the number." It is probable that one of the chief benefits derived by invalids from a winter sojourn at Alpine or tropical resorts is due to the larger amount of sunlight enjoyed.

What Florence Nightingale says of the value of light to those who are ill, indicates no less its necessity for those who are well. "Second only to fresh air, however, I should be inclined to rank light. Direct sunlight, not only daylight, is necessary for speedy recovery. Instances could be given, almost endless, where in dark wards, or in wards with a northern aspect, even when thoroughly warmed or in wards with borrowed light, even when thoroughly ventilated, the sick could not by any means be made speedily to recover.

The dark side of the street is far more subject to disease than the light side. Sir James Wilie found three times as many cases of disease on the shaded side of the barracks at St. Petersburg as on the other side. Dupuytren is said to have wrought a cure, in the case of a lady in a seemingly desperate condition, by simply removing her from her dark quarters to a brighter residence, and keeping her as much as possible in the daylight,

A prominent physician, Dr. J. N. Farrar, who has paid special attention to the effect of the presence or absence of light in living rooms upon health, found that in his own case when occupying a room facing north, his general health was not nearly so good as when his window had a southern exposure. General experience will confirm this conclusion. Human beings, like plants, need an abundance of light, and if denied it they pine and wilt.

WINDOWS.

The height of a window has an important bearing on the amount of sunlight which is admitted, and also upon the ability to ventilate a room. If a window is low a stratum of hot air may lodge near the ceiling; hence, the windows should be high enough to carry off the foul air when they are lowered. Curtains, lambrequins, and other draperies to windows and doors also hinder the admission of light and the free circulation of air, while they accumulate quantities of dust. A well-known New York physician, who has had occasion to observe this fact, has abolished curtains altogether in his house, and moderation in their use is recommended.

The same complaint which Erasmus made of the small windows of English dwellings of the time of Henry VIII. may be repeated regarding the much admired esthetic houses of the present period.

Dr. Richardson, the eminent English sanitarian, objects to houses built in the Queen Anne style, because of their insufficient light. "These beetle-browed mansions," he says, are not beautiful, and never can be, and he protests against their interference with the sun. Those who occupy them live in shadow, and he calls their small windows and panes, overhanging cornices, sharped pitcher roofs, enclosing attics with small windows, an "architectural perversity." Yet even with large windows, light may be shut out by adjoining obstacles, as high walls, especially if one is so unfortunate as to live next to one of the lofty apartment houses, which disfigure the metropolis. Under these circumstances, various expedients may be employed to increase the light. Sir David Brewster recommended placing ground glass set flush with the outer wall, instead of just within, in order to better diffuse the light within a room. Such an arrangement would not be very sightly, but might be used for lighting small and unimportant rooms, as closets and others. A similar effect may be produced by grinding the surface of the plate glass in ordinary windows or by having a blind of fine white muslin or other similar material.

STAIRWAYS AND HALLS.

Stairways have an important bearing upon the healthfulness of a house, as they are the chief means of supplying light and air for the interior. Regarding them, a quaint old architectural writer says pithily: They should have "a very liberal light against casualty of slips and falls. The space above the head must be large and airy, which the Italians used to call *un bels fogolo*, as it were good ventilation, because a man doth spend much breath in mounting. That the half-spaces be well distributed at competent distances for reposing on the way. That to avoid encounters, and, besides, to gratify the beholder, the whole staircase have no niggard latitude. In most modern houses these wise axioms are disobeyed; stairways are steep, narrow, cramped, dimly lighted, and with few resting places for the panting and toiling climber, while in proportion as one ascends, the air gets more and more impure, until, at the top it is the concentrated contamination of the whole domestic laboratory of foul odors.

REVIEWS AND NOTES.

"The Physician's Visiting List for 1891" enters its fortieth year of publication. It is published by P. Blakiston, Son & Co., 1012 Walnut street, Philadelphia, and is complete for the office it is intended to fill. An estimate of its worth can be gained from its contents, which are as follows: Almanac for 1891 and 1892. Table of Signs, to be used in keeping accounts. Marshall Hall's Ready Method in Asphyxia. Poisons and Antidotes, revised for 1890. The Metric or French Decimal System of Weights and Measures. Dose Table for 1891, by Hobart Amory Hare, M. D., Demonstrator of Therapeutics, University of Pennsylvania. List of New Remedies, revised for 1891. Aids to Diagnosis and Treatment of Disease of the Eye, Dr. L. Webster Fox, late Clinical Asst. Eye Dept., Jefferson Medical College Hospital, and G. M. Gould, M. D., Ophthalmic Surgeon to the Philadelphia Hospital; Clinical Chief Ophthalmological Dept., German Hospital, Philadelphia. Diagram Showing Eruption of Milk Teeth, Dr. Louis Starr, late Prof. of Diseases of Children, University Hospital, Philadelphia; Physician to the Children's Hospital. Posological Table, Meadows. Disinfectants and Disinfecting. Examination of Urine, Dr. J. Deland, based upon Tyson's "Practical Examination of the Urine;" sixth edition. Incompatibility, Dr. S. O. L. Potter (taken from Dr. Potter's Handbook of Materia Medica, Pharmacy and Therapeutics, second edition). A New, Complete Table for Calculating the Period of Utero-Gestation. Sylvester's Method for Artificial Respiration; illustrated. Diagram of the Chest. Blank Leaves, suitably ruled, for Visiting Lists, Monthly Memoranda, Addresses of Patients and others; Addresses of Nurses, their references, etc.; Accounts asked for; Memoranda of Wants; Obstetric and Vaccination Engagements; Record of Births and Deaths; Cash Account, etc.

"KNOWLEDGE" is a unique little magazine which ought to have great popularity among all owners of Cyclopedias. It undertakes to supply the information which one ordinarily seeks in his Cyclopedia and fails to find there, because it is not "up to date"—it was published "last year," or, more probably, several years ago. "The world moves," and the most important questions that want answering are questions of to-day, not of yesterday. *Knowledge* answers, during the year, several thousand such questions. It is published weekly, for the amazingly small sum of 50 cents a year; specimen copy free. John B. Alden, publisher, 393 Pearl street, New York.

We have received from Funk & Wagnalls, of New York, the prospectus and several sample pages of their "Standard Dictionary of the English Language." On examination of the plan of this work, we feel justified in saying that it will meet with a demand that is supplied by no other dictionary extant. Its utility is at once manifest, and, with the eminent scholars engaged in its preparation, its accuracy cannot be doubted. In some very important points it differs widely from the plans of other dictionaries: 1. The "locating" of the verifying quotations—that is, the giving in each instance not only the name of the author, but also the name of the book and the number of the page where the quotation can

be found. To thus "locate" 50,000 quotations is of itself a herculean task. 2. The use, in the pronunciation of words, of the scientific alphabet adopted by the American Philological Association. 3. The placing of the etymology after the definition. 4. The placing of the most important current definition first, and the obsolescent and obsolete meanings last—that is, the substitution of the order of usage for the historic order usually followed in dictionaries. 5. In the case of disputed pronunciation, the giving of the pronunciations preferred by other dictionaries, as well as the pronunciation which they prefer. 6. The giving of 50,000 vocabulary words more than are to be found in any other single-volume dictionary in England or America. Such a work will readily find a place in every office, library and study in the country.

One of the most handsome cards we have had the pleasure of seeing at the beginning of 1891, bearing the greetings of the New Year, is issued by James B. Clow & Son, Lake and Franklin streets, Chicago. It is beautifully printed in colors, and has the plans for plumbing for a flat building, a residence and a cottage, drawn in accordance with the plumbing regulations of Chicago, designed by Chief-Inspector Andrew Young. The card is not only an ornament, but an object-lesson in correct plumbing. Messrs. Clow & Son are extensive manufacturers of and dealers in plumbers', gas and steam fitters' supplies, and have established an enviable reputation for fair dealing and honest work. They are the manufacturers of the celebrated "Clow's Royal Granite Laundry Tubs," with zinc top and single outlet connection, which fulfil every demand of proper sanitation, and are furnished at no greater cost than the very objectionable and unsanitary wooden tubs.

Accompanying an illuminated calendar for 1891, we have the compliments of The James Allison Plumbing Company, of 122 Main street, Cincinnati. The character of this firm can be judged from the following, quoted from the back of the calendar: "Remember, when you are having the plumbing work placed in your residence, you are fitting up a place in which to live. It can be constructed open to all the dangers of disease, or made secure against them. The one may cost a little more than the other, but it is cheaper to pay more for health than to incur the risk of sickness, besides the many annoyances attributable to work poorly done. The difference in cost will be more than covered by the omission of a little decoration on the walls, and add very materially to your own pleasure and the health of your family." No one will make any mistake by employing a plumber whose work is based on these principles.

The Standard Manufacturing Company, of Pittsburg, sends us their "Special Bath-Tub Catalogue," which is a high work of art in the way of printing and illustration. Their Wood street exhibition, rooms A and B, as illustrated in the front of the catalogue, are magnificent pictures of elaborate bath-rooms, and demonstrate what the company can do in the way of producing ornate and sanitary appliances. The bath-tub manufactured by this company is designed to meet all the requirements of such a necessity in every household. It is manufactured of cast iron, made of the best quality of pig-metal. After being cast in a sand mold, it is cleaned by a "pickling" process which removes all particles of sand, scale and other foreign substances, leaving a surface of smooth, clean iron. It then receives a coating of thin porcelain in solution, and dried gradually, leaving a white precipitate on the iron surface. The tub is then subjected to intense heat, and the porcelain and iron are fused together, making a thorough amalgamation of the two substances. While the tub is still at a bright red-heat, the porcelain enamel is applied in a fine, floury powder, which readily adheres to the heated surface, and is permanently fixed. After successive coatings of this kind, the tub is gradually cooled, and a porcelain enameled tub is produced which has the purity, finish and resistance of glass and the durability and strength of iron. The tub thus produced is an ornate piece of furniture, a durable fixture and a sanitary necessity—a combination in this advanced day of sanitary plumbing which must impress the public mind with its universal worth.

AMONG THE PLUMBERS.

The Rundle & Spence Manufacturing Company have sent their compliments in the shape of a neat pamphlet to their many patrons. The firm has opened a branch store at 193 Lake street, Chicago, which will be under the management of W. M. Webster, who is so well-known in the trade throughout the West. A full line of plumbing, steam and gas fitters' supplies will be carried in the new quarters on Lake street as well as in Milwaukee.

W. J. Freaney, J. F. Holmes and Richard Cheenery, master plumbers of St. Paul, Minn., were appointed on the examining board to investigate the fitness of plumbers applying for a license. The aplication of Thomas Fanning was rejected by this board and Mr. Fanning applied to the courts for assistance, but Judge Kerr refused to grant his prayer and sustained the action of the board.

The Health Department of Chicago is not the only organization of its kind that insists on making it unpleasant for plumbers who do not do their work properly. The Board of Health of Philadelphia has recently figured in a suit against three master plumbers of that city who refused to comply with the regulations in the drainage of certain houses. The accused finally repented and carried out the regulations to the very letter. The Health Department has abandoned the prosecution and peace now reigns supreme with this department and the three delinquent plumbers.

Lennox & Co. will continue the plumbing business formerly conducted by the Heiser Bros., at Piqua, Ohio.

Wm. E. Goodman, Milwaukee's able representative at the Denver convention, is doing a great deal of gilt edge plumbing outside his own city.

Bay City, Mich., has a new plumbing firm which will do business under the title of The Sullivan Plumbing and Steam Heating Company.

The plumbing firm of Heiser Bros. will open up a shop in Urbana, Ohio. This firm has been doing a prosperous business at Piqua, Ohio, but the flattering prospects for an enormous business at Urbana have induced them to sever their business connection with the former city.

The strike among the Chicago steamfitters still hangs on stubbornly and there is no immediate prospects of a settlement between the waring factions. The strikers are receiving assistance from organizations outside the city, and are praying for cold weather, which they think will bring the bosses to time.

Gen. John B. Newton, consulting engineer for the Chicago sanitary district is getting things well organized in his new office for the coming year.

Stepka & McInery have purchased the plumbing business of J. S. Cusick at Minneapolis, Minn.

The plumbing business of Fox & Co., at Las Vegas, New Mexico, will be conducted in the future by Hast & Connell.

Pittsburg Plumbers: Bowes & Cowling will plumb four houses on Forty-third street in the seventeenth ward; J. C. Hare & Co. will fit up a house on ninth street in the fourth ward; Houston & McShane will do the plumbing work in a building on Aiken avenue in the twentieth ward; John Conley has a contract for the work in a house on Negley avenue in the twentieth ward, and in another on Hiland avenue in the nineteenth ward.

Louis Bain, of West Madison, who recently suffered a paralytic stroke, is slowly recovering.

Ex-President Hannan continues to make investments in real estate and buildings in Washington. He will erect three handsome residences on M street, between Fourth and Fifth streets, Northwest, at a cost of $25,000.

It seems that the old court house building in this city is still reeking with sewer gas, notwithstanding the objections of several judges who are compelled to sit day after day in an atmosphere unfit for human beings. Judge Altgeld is the last one to make complaint, and has sent a communication to the county board requesting immediate action in remedying the deadly evil.

The American Plumbing Company of Winnipeg, Man., has been sold to J. M. Wells, of that city.

The Rochester (N. Y.) *Democrat and Chronicle* of December 20th contained the following account of the visit of the Rochester Master Plumbers' Association to the evening classes in the Mechanics' Institute on December 19th: "Between thirty-five and forty members of the master plumbers' association visited the Mechanics' Institute last evening and went through various rooms

where classes were at work. Professor Colby explained the method of work in the first year of the mechanical class, and Mr. Rose did the same in the second year machine class. The plumbers were particularly pleased with the work going on in the modeling in clay class, and with the system of work in the second free hand class. Before departing they took occasion to express to Captain Lomb and several of the trustees present the pleasure they had in their visit and their appreciation of the good the institute was doing. Captain Lomb stated that the institute hoped to be able soon to secure professional men to deliver lectures on the various mechanical trades; but if the lectures could not be secured, he hoped that some one of the members of the plumbers' association would read a practical paper on plumbing and that a few would engage in a discussion some evening when all journeymen could be present. The master plumbers assured Captain Lomb of their hearty co-operation."

Shaffer & Co., of Lawndale, were fined $10 and costs by Justice Wallace last Wednesday for doing defective plumbing.

Mr. Jones, an old time plumber, of Rockford, Ill., was in the city for a few days this week, visiting his many friends and acquaintances. While here Mr. Jones attended the reunion of the society of the Army of the Potomac at the Sherman House. Mr. Andrew Young and Mr. Jones occupied a table together on this occasion, and had a very enjoyable time fighting the battles over again in the Shenandoah Valley. Mr. Jones honored the Health Department with a call on Wednesday, and obtained the city rules and regulations governing plumbing.

George Hibberd & Son, of Wheeling, W. Va., have opened very fine show rooms at 1314 Market street. This firm will carry an enormous line of specialties for such a small city.

William Bunting, who took a sub-contract of plumbing from the firm of Morse & Harvey, was fined $50 and costs for doing defective work and had his license suspended.

Alderman Ryan submitted an ordinance to the common council last Tuesday evening raising the plumbers' license fee from $1 to $100. After discussing the necessity of such a provision to protect the plumbers, the subject was referred to the Judiciary Committee. It soon became noised about that the license fee would be raised to $100, and on Wednesday the water office was full of plumbers trying to get their licenses. In talking with one of Chicago's most prominent plumbers he expressed the idea that raising the license fee to $100 would be a good thing for the Chicago plumbers, since plumbers of other cities are talking of establishing branch shops here, during the World's Columbian Exposition. While the Chicago master plumbers are citizens and taxpayers they would be compelled to compete with non-residents who are doing plumbing work in Chicago for revenue only.

One of the new school buildings at Toronto, Ont., has been condemned by the plumbing inspector. The job no doubt was given to the lowest bidder in order to get cheap plumbing.

The Kilbourne & Jacobs Manufacturing Company, of Columbus, Ohio, have sent their many patrons a neat little pamphlet wishing them a happy and prosperous new year. Any one can obtain a catalogue of their blast furnace and gas works' appliances by dropping a line to the company at Columbus.

The board of architects for the World's Columbian Exposition is composed of the following well-known architects from the leading cities of the Union: From New York, George B. Post, R. M. Hunt, president of the American Society of Architects, and McKimm, Meade and White. From Boston, Peabody & Stearns. From Kansas City, Van Brunt & Co. From Chicago, Henry Ives Cobb, Adler & Sullivan, Burling & Whitehouse, W. L. B. Jenney and S. S. Beman.

The Master Painters' and Decorators' Association of Illinois, will hold its fourth annual convention in Chicago on January 14th and 15th, at 78 Fifth avenue. The first session will begin at 10 A. M.

THE CHICAGO MASTER PLUMBERS.

The first meeting of 1891, held by the Chicago Masters Plumbers' Association, occurred at Grand Army Hall on Thursday evening, January 8th.

The familiar face of Mr. Hugh Watt was seen among the large number of master plumbers before the meeting was called to order. At the usual time for beginning the evening session Mr. Watt called the meeting to order.

R. T. Connell, the acting President of the Master Plumbers' Association, at St. Joseph, Mo., being in the audience, was invited to take a seat on the platform beside Mr. Watt. Mr. Connell favored the members with a short speech concerning the state of the association at St. Joseph.

The minutes of the last regular meeting, and of the special meeting, called to draft resolutions concerning the death of Martin Moylan, were read and approved.

Mr. Wade, of the Sanitary committee, submitted his annual report, and dwelt at length upon the general subject of Sanitary Science, and the work accomplished by the Sanitary committee during the year. The paper was well received by the members, and after a vote of thanks to the author, it was spread upon the records.

Mr. P. Macey presented the report of the Arbitration committee.

Mr. Daniel Rock, in giving the report of the License committee, stated that he had been powerless to prevent incompetent men from obtaining licenses during the past year.

Mr. Murray, of the Apprenticeship committee, gave a summary of the year's work in this direction.

Alderman Ryan, of the Legislative committee, made a very appropriate address to the meeting. Mr. Ryan stated that Mr. Young had done more for the city of Chicago than the Health department had done since its organization.

On motion of Mr. Murray, the ordinance prepared by Mr. Ryan was adopted by the association.

The unusual large number of master plumbers present indicated that some very important business would be transacted, and the discussion on the report of the Legislative committee revealed the fact that the master plumbers are fully awake to the needs of some protection on the license question.

Mr. Dalton, a recently elected member, was introduced to the association, and upon request, made a short speech.

Mr. David Whiteford, on behalf of the executive committee, read his annual report.

Mr. Hamblin, treasurer of the association, read his report for the last quarter of 1890, and also the annual report.

Mr. Mandable, financial secretary of the association, presented a very systematic annual report, showing the increase of the association during the last year.

G. J. Mertz, of 2230 Archer avenue, sent in his application for membership.

A communication was read from E. J. Hannan, of Washington, expressing his sympathy with the association in the loss of their able member, Martin Moylan.

The next thing in order was the election of officers for the ensuing year. The names of Messrs. Wade, Nacey, Whiteford and Corboy were placed in nomination. Mr. David Whiteford receiving a majority of the votes cast, was declared unanimously elected president.

For first vice-president the names of Messrs. Mandable, Gay, Culloton, Corboy, Bryer, Nacey and Wade were placed before the association.

While the votes were being cast, Messrs. Nacey and Griffith escorted the new president, Mr. Whiteford, to the platform, who made a neat little speech outlining the work for the new year.

Mr. M. J. Corboy, on the third ballot, received a majority of the votes cast for first vice-president.

The application for membership of Dan. Burns, of Forty-third street and Lake avenue, was received.

Charlie J. Herbert was elected for second vice-president.

C. A. Cavanah received a majority of the votes for third vice-president.

Mr. A. C. Hickey was elected forth vice-president, and G. J. Stokes completes the list of the five vice-presidents.

Mr. P. Sanders was elected treasurer, and James De Veney was selected as the financial secretary for the ensuing year.

It was moved and seconded that the secretary cast the unanimous ballot of the association for Harry Black for recording secretary.

Paul Rediske was elected sergeant-at-arms.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chattanooga, Tenn.: Architects Lamm & Hunt are preparing plans for a hospital for the Hospital Association, of which G. A. Baxter is secretary. Cost, $100,000. Architect S. M. Patton is preparing plans for a dwelling for L. S. Colyar. To be three-stories high, and cost $60,000.——Marshall, Tex.: Manager C. E. Roberts will erect a saw-mill near Alexandria, La., for the Rapids Lumber Co.. Dallas, Tex. To be two-stories and cost $30,000.——Brooklyn, N. Y.: Sacket street, near Van Brunt street, five five-story brick flats; cost, $55,000. John L. Young, architect. Corner Bedford and Lafayette avenues, a one-story brick church; cost, $35,000. Parfitt Bros., architects.——Chicago: May and Ohio streets, eleven two-story and basement apartment buildings; cost, $25,000. D. S. Pentecost, architect. W. W. Boyington & Co. are working on sketches for the Illinois state building for the World's Fair; cost, $400,000 to $500 000. No. 3030 State street, three-story store, flat and hall building; cost, $15,000. J. H. Huber, architect. Lake avenue, near Thirty-ninth street, block of five-story flats. L. B. Dixon, architect. State street, south of Sixty-seventh street, three-story store and flat building; cost, $15,000. E. B. Krause, architect. Same architect is working on plans for a six-story and basement apartment building to be erected on the South Side; cost, $100,000. A handsome club house will be built at Montrose for the Montrose club; cost, $70,000. Julius Speyer, architect. Flanders & Zimmerman are working on drawings for a school building; cost, $70,000. Wabash avenue and Fourteenth street, five-story apartment building; cost, $50,000. Robert Rae, architect. Same architect is getting out plans for a three-story flat building; cost, $15,000. Berkley avenue, near Forty-third street, three-story flat building; cost, $14,000. Same architect. Harrison street, near Center avenue, four-story store and flat building; cost, $12,000. Chestnut and Pine streets, five four-story residences; cost, $100,000. C. W. Palmer, architect. Nos. 111 and 113 Forty-seventh street, two three-story and basement residences; cost, $30,000. Same architect.—— New York City: Elm street, near Pearl, a twelve-story brick factory; cost, $800,000. Buchman & Deisler, architects. 125 Madison street, a five-story brick-flat; cost, $20,000. Charles Rentz, architect. 117th street, near Morningside avenue, four five-story brick flats; cost, $20,000. W. A. O'Hea, architect. 531 Thirty-second street, West, a six-story brick storage house; cost, $50,000. Lederle & Co., architects. 170th street, near Third avenue, a seven-story brick brewery; cost, $50,000. Lederle & Co., architects. Corner First avenue and 105th street, four five-story brick and stone flats; cost, $80,000. Walgrove & Israels, architects. Seventy-second street, near Lexington avenue, a five-story brick and stone stable; cost, $75,000. L. Weiher, Jr., architect. Ninety-fourth street, near Third avenue, two five-story brick flats; cost, $36,000. F. S. Barns, architect. 125th street, near Madison avenue, a two and three-story brick store and assembly rooms; cost, $50,000. Andrew Spence, architect.——Washington, D. C.: Work will soon be commenced on Mr. Rudolph Kaufmann's residence on 16th street, between P and Q, northwest, from the plans of Architect Gray. It will be three-stories high; cost, $20.000. Architect O. Van Nerta has plans for a row of six dwellings to be erected on R street, between 22nd and 23rd, northwest; cost about $40,000. Mr. E. J. Hannan will erect three residences on M street, between 4th and 5th, northwest. They will cost $25,000.—— Yankton, S. D.: A new hotel building will be erected; cost, $35,000. J. Hodgesen, Jr., Omaha, Neb., architect.——Hamburg, Ia.: A two-story hotel will be erected; cost, $35,000. Henry Voss, Omaha, Neb., architect.—— Lincoln, Neb.: An Episcopal school will be erected; cost, $50,000. J. H. N. Hawkins, Omaha, Neb., architect.—— Omaha, Neb.: J. R. Hamilton and George Peterson will build two dwellings, to cost $15,000 each. The Plattdeutscheverein, of Omaha, composed of leading Germans, propose building a six-story structure, to be used as a theatre, and for offices and stores. ——Pottstown, Pa.: New store buildings are to be erected, in the place of the burnt ones, for Messrs. L. and M. C. Beecher, R. Morgan Root and D. K. Hatfield. There is an effort on foot for the raising of means to build a hospital, which, if accomplished, will take over $40,000.——Pickens County. S. C.: It is proposed to erect a new court house and jail in this county.——Salt Lake City, Utah.: Corner Second South and Fourth East streets, a two-story brick store building; cost, $25,000. Fred A. Hale, architect.——Stanwick, N. J.: A factory is to be erected by the Stanwick Carpet Company.——Syracuse, N. Y.: Warren Leland, proprietor of the Leland Hotel, recently destroyed by fire, proposes to rebuild the coming season.——York, Pa.: East Philadelphia street, corner Pine, a school-house; cost, $20,000. B. F. Willis, architect.——Milwaukee, Wis.: The Senate Committee on public buildings and grounds have received from Supervising Architect Windrim his report on the Senate bill to add $400,000 to the limit of the cost of the new government building at Milwaukee.——Ann Arbor, Mich.: The Wesleyan Guild will build a $45,000 hall for students.——Grand Rapids, Mich.: A. W. Rush & Son have plans for a three-story seven-flat building to be on northwest corner Park and Ransom streets; cost, $25,000. Pantlind & Co. are having made preliminary drawings for a six-story rear addition to the Morton House fronting on Ionia street. William G. Robinson, architect. James G. Alexander will at once partially remove and rebuild the Windsor Home, southeast corner East street and Fifth avenue. Also build other houses near, have windmill for water supply and all modern improvements. The Oriel Cabinet Company will soon commence a five-story brick factory building on canal street. Architect J. H. Doverman has designed for E. A. Hamilton a residence, three-stories high; cost, $11,000. The same architect has prepared plans for stores and offices to be erected on West Bridge street; cost, $15,000. Architect W. G. Robinson has plans for twelve tenements to be erected at the corner of Barkley street and Crescent avenue; cost, $10,000.——Duluth, Minn.: Architects McMillen & Radcliffe have plans for a manufactory to be erected at New Duluth; for the Hurd Refrigerator Company. To be one-story high, built of common brick; cost, $50,000.——Canton, Ohio: The Reymann Brewing Co., of Wheeling, W. Va., have decided to rebuild the Lake Park Hotel. The plans of the new buildings are in the hands of I. J. Knapp, architect.——Detroit, Mich.: Corner Lafayette avenue and Shelby street, a brick and stone opera house; cost, $500,000. 331 Gratiot avenue, a three-story brick brewery; cost, $80,000. Spier & Rohns, architects. Grouse Pointe, (suburb of Detroit) a three-story brick summer residence. cost, $15,000. Malcomson & Higginbotham, architects. Northwest corner Michigan avenue and Shelby street, six-story addition to brick hotel; cost, $38,000. John Scott & Co., architects. ——Frederick, Md.: Dwelling, with all the modern conveniences; cost, $20,000. J. A. Dempwolf, architect.—— Lowell, Mass.: Prescott street, five-story brick block. Merrill & Cutler, architects. Middlesex street, a five story brick block. Merrill & Cutler, architects. Fred Ayer is to erect a set of buildings at Lawrence. ——Williamstown, Mass.: Harly I. Proctor is to erect a fine colonial house and stable. F. W. Stickney, Lowell, architect.—— Milwaukee, Wis.: Fourth and Chestnut streets, a storehouse; cost, $25,000. Pabst Brewing Company. Florida street, a boiler house; cost, $8,000.—— New Albany, Ind.: The project to tear down the market houses and build on their site a fine city hall, public library and Y. M. C. A. building is being revived, and pushed to a successful termination if possible. The congregation of the First Presbyterian church will expend $15,000 remodeling and decorating that structure.——Omaha, Neb.: Charles Gerold has prepared plans for a hotel and store located on South 11th street, It will be four-stories high and cost $35,000. Henry Voss is preparing plans for a hotel and store to be erected on South 10th street. It will be five-stories high; cost, $50,000. Chas Gerold has prepared plans for five engine houses for the Board of Police and Fire commissioners; cost, $75,000. Cleeves Bros. have prepared plans for a banking house for the Union Stock Yards bank, South Omaha; cost, $35,000. Cleeves Bros. have prepared plans for a bank and office building to be erected on 15th and Douglas streets. To be six-stories high, stone and brick; cost, $150,000. Mendelsohn, Fisher & Lawrie have plans for a bank building; cost, $75,000. Arthur Baker has plans for the remodeling of the old *Bee* newspaper building into a hotel. To be four-stories high and cost $30,000. Mr. McElfatrick, St. Louis, Mo., has prepared the plans for a theatre to be erected corner 17th and Harvey streets for Governor elect James E. Boyd. To be five-stories high and cost $250,000. J. L. Burgeouis has plans for a

hotel to be erected corner 16th and Jackson streets for J. F. Sweezy; cost, $100,000.——Minneapolis, Minn.: 757 to 761 Washington avenue, North, three-story brick block stores and flats; cost, $28,000. Edward S. Stebbins, architect. 212 11th avenue, South, three-story brick flats; cost, $12,000. W. Hunt, architect. ——Colorado Springs, Col.: L. M. Wood, Denver, Col., has prepared plans for a hotel for a syndicate. To be six-stories high; cost, $150,000.——Boston, Mass.: Wareham street, remodeling brick building; cost, $25,000. J. J. McNutt, architect. Commonwealth avenue and Charles Gate, West, six brick dwellings; cost, $30,000. Samuel D. Kelley, architect.——Baltimore, Md.: The Fidelity and Deposit Company, of Maryland, intends erecting an eight-story office building; Messrs. Baldwin & Pennington are making the preliminary sketches.——Buffalo, N. Y.: Main street near Allen street, four-story brick carriage factory; cost, $16,000. C. K. Porter & Son, of American Block, architects. A six-story apartment house is to be built on McMillan street at the head of Elm, by Fred Alms, of the Alms & Doepke Co.; cost, $100,000. ——Columbus, Ohio: Front street, between Spring and Chestnut streets, a brick business house; cost, $25,000.——Denver, Col.: Larimer street, between 22nd and 23rd streets, a brick block; cost, $40,000. F. E. Edbrook & Co., architects. Broadway, between 5th and 6th avenues, a brick building; cost, $22,000. F. E. Edbrook & Co., architects. Pennsylvania avenue, near 11th avenue, a stone residence; cost, $18,000. I. Hodgson, architect.

HEATING AND LIGHTING.

Newberry, S. C.: The city contemplates the erection of an electric light plant. The Mayor can give informotion.——Wilson, N. C.: The city will issue $60,000 of bonds for the construction of water-works, and $15,000 for the erection of an electric light plant. ——Corpus Christi, Tex.: The Corpus Christi Electric Light Company will put additional machinery in its electric light plant.—— Memphis, Tenn.: A. W. Allison, B. M. Stratton, W. H. Bates and others of Memphis have incorporated the Crowdus Chemical Electric Company, to furnish electric light and power, etc.—— Farmville, Va.: The Electric Light, Heat and Power Company has been organized, with C. M. Walker, president, and J. M. Crute, secretary. The capital stock is $100,000.——Grafton, W. Va.: The Grafton Electric Light, Heat and Power Company contemplates putting additional machinery in its electric light plant.—— Cleveland, O.: The Barrett Elevator Company will want prices on dynamos and motors.——Nashville, Tenn.: The city will purchase two steam fire-engines, two chemical engines and other fire apparatus. The Board of Fire Commissioners can be addressed. ——Norfolk, Va.: The Board of Fire Commissioners wants proposals for furnishing 1,000 feet of rubber hose, 2½ inches in diameter, with couplings.——Sylvester, Ore.: An electric lighting plant will be established.——Manchester, Conn.: The Mather Electric Light Company will apply to the Legislature for a charter for street-lighting.——Danville, Ill.: The Danville Gas, Electric Light and Street Railway Company has been incorporated; capital, $250,000. Incorporators—Andrew C. Daniel, Frank W. Penwell, and others.——San Diego, Cal.: The San Diego Electric Transit and Power Company is the title of a recently incorporated concern; capital stock, $1,000,000. Its purpose is to operate an electric railway system and furnish electric motor power in San Diego.—— Greenwood, Miss.: The streets are to be lighted by gas.——Sibley City, Minn.: There is a movement toward lighting the public streets, etc., by electricity. Alderman Zimmermann can furnish particulars.——Pittsburg, Pa.: The Commonwealth Gas Company has been incorporated, with a capital stock of $10,000. James B. Decker is one of the dircctors.——Newark, O.: The city council contemplates lighting the city with electric lights.——Glen Cove, N. Y.: Gas works will be established.

SEWERAGE NOTES.

Belfast, Me.: A plan for a complete sewerage system for the city of Belfast has been made by Wheeler & Parks, of Boston, who estimate that the entire cost of the system will be from $45,000 to $50,000.——Buffalo, N. Y.: The Buffalo council has contracted for the construction of sewers in Montgomery, Gatchell, Ellicott, Goodell, Niagara, Oak and Red Jacket streets, and Auburn and Rother avenues.——Charlottesville, Va.: The mayor of Charlottesville is in correspondence with engineers upon the subject of a sewerage system for that city.——Pullman, Wash.: The most important work to be undertaken by the city council will be the construction of a sewerage system for the business section of the city.——Erie, Pa.: The Erie councils and water department have agreed upon plans for an intercepting sewer, which will convey the sewage beyond Presque Isle Bay into the lake. It will cost $100,000.——Washington, Pa.: A considerable amount of sewerage work is to be carried out on the Waring system. Wilson & Smith are the engineers in charge of the work.—— Macon, Ga.: The Legislature has passed a bill authorizing the city to issue bonds for $210,000 for sewerage and drainage.—— Cicero, Ill.: The special committee appointed to confer with the drainage commission of Chicago reported at a recent meeting that they had consulted the engineer of said commission, and in his opinion the town of Cicero was perfectly safe in carrying out the plan of drainage and sewerage as prepared by Mr. Alvord, the town engineer. The report was adopted.——Savannah, Ga.: Alderman Fallagant has presented a report upon and an estimate of the cost of his proposed system of house-drainage.——West Toronto Junction, Ont.: A report on the sewerage has been submitted to the Committee on Sewerage by Mr. Biggs, the engineer. The work will involve the expenditure of $250,000.——Bay City, Mich.: Considerable sewer work is to be done. Address George Turner, city surveyor, for particulars.——Holyoke, Mass.: Considerable sewer work is to be done.

WATER-WORKS NOTES.

Vicksburg, Miss.: The Vicksburg Water Supply Company will extend its water-works.——McMinnville, Tenn.: Ingersoll & Peyton, of Knoxville, representing Eastern parties, have made a proposition to construct water-works at McMinnville.——Pine Bluff, Ark.: Henry Cook will purchase pumps.——Cisco, Tex.: The Cisco Water Company wants complete outfit for water-works. ——Yoakum, Tex.: The Yoakum Water Power Company will build the new water-works.——Toledo, Ohio: A company has been organized to build water-works and put in electric lights and a street railway at Put-in-Bay.——Waterville, Wash.: The city has given 700 acres to a syndicate, which is considering putting in a system of water-works and erecting an electric light plant.—— Van Buren, Ark.: The village wants water-works. Mayor H. C. Hayman can give information.——Worcester, Mass.: The joint standing committee on water has voted to ask the city council for an appropriation of $35,000 for water construction. This is the same amount asked for last spring when $30,000 was appropriated. ——Harlem, Ill.: The village board has appropiated $250 for plans for water-works and general drainage for the village.—— Newport, Pa.: The Newport Water Company has been incorporated. The directors are: Charles A. Mahony, Charles A. Rutter and Joseph H. Young, all of Philadelphia.——Colorado Springs, Col.: The Lakeside Land and Water Company has been organized. The incorporators are: J. C. Plumb, F. W. Howbert, S. N. Francis, W. R. Barnes and J. G. O'Brien, and the capital stock is $50,000.——Wheeling, W. Va.: The Mount de Chantal Academy at Wheeling, W. Va., will sink an artesian well and put in an electric light plant.——Eureka, W. Va.: Daniel O'Day, of Buffalo, N. Y., C. N. Payne, of Titusville, Pa., T. R. Campbell, of Oil City and others, have incorporated the Eureka Pipe Line Company of Eureka, W. Va., with a capital stock of $1,000,000.——Fort Valley, Ga.: The bill authorizing this city to issue bonds for water-works has passed both Houses and will become a law as soon as it receives the signature of the Governor. Senator Culpepper can furnish particulars.——Richmond, Mo.: The people of this place are to vote on the question of establishing a system of water-works.——Wilkesbarre, Pa.: The Parsons Water Company has been incorporated with a capital stock of $3,000.—— Highland, Ala.: A bill is to be introduced in the Legislature to authorize this city to issue bonds in the sum of $75,000 for water-works and other public improvements.——Foxboro, Mass.: The city officials are considering the question of establishing a system of water-works.—— Greenville, Tex.: It is proposed to sink a number of artesian wells with a view of establishing a system of water-works.——New Britain, Conn.: Extensive improvements are to be made to the water-works plant. Address L. H. Pease for particulars.——Reading, Pa.: City Engineer Samuel S. Heoff has submitted his report regarding the best method of utilizing the water from the Maiden creek.——Ponca, Neb.: The city held a special election for voting on water bonds, and the city council is now receiving bids for printing said bonds. Amount of bonds voted, $10,000. Address C. W. Kingsbury.——Shelbyville, Tenn.: Ingersoll & Peyton, of Knoxville, Tenn., representing Eastern parties, have opened negotations with the authorities of Shelbyville, Tenn., looking to the construction of water-works.——Woodland, Cal.: The general feeling at Woodland is in favor of bonding the city for water-works, a sewerage system and public building.——Ironwood, Mich.: George Cole Stephens, engineer of water-works system, Ironwood, wants bids for pumps of 1,000,000 gallons capacity, and boilers 16 feet long by 54 inches diameter.

——Greenville, Miss.: The Delta Water-works, Sewerage and Light Company of Greenville, is to construct a system of water-works.——Greenwood, Miss.: The construction of a system of water-works is projected.——Bay St. Louis, Miss.: The Gulf Coast Ice and Manufacturing Company will construct a system of water-works.——Atlanta, Ga.: A bill has been introduced in the Georgia legislature to provide for the appropriation of $25,000 for the erection of a water-works, a steam laundry, etc., at the State Deaf and Dumb Asylum.——Los Angeles, Cal.: The Dehesa Land and Water Company has been incorporated. Capital stock, $360,000. Directors: George L. Arnold, J. H. Spires, Leon F. Moss, C. M. Wells and S. H. Kingery.——Quincy, Ill.: Plans have been submitted by Mac Ritchie & Nichol, of Chicago, to the water committee for a system of water-works, including a brick pumping station, two pumps, with an aggregate daily capacity of $10,000,000 gallons, a supply pipe to the channel of the river, a reservoir of 20,000,000 gallons capacity, and 71.2 miles of mains. The estimated cost is from $600,000 to $620,000.——Albany, N. Y.: Engineer de Verona has made his report to the Special Water Committee regarding the feasibility of obtaining a water supply. A survey of the water-shed has now been ordered by the commission. John G. Myers, of the Special Water Commission, can furnish particulars.——Oakland Neb.: The people have voted to make an appropriation for establishing a system of water-works.——Liberty, Neb.: The projected water-works will soon be established.——Arcadia, Neb.: Important steps towards the construction of a system of water-works are to be taken soon.——Quincy, Mass.: The city council has accepted the report of the engineer upon a source of water supply for the city, and an order has been passed requesting the mayor to petition the legislature for authority to establish the proposed system, at an estimated outlay of $500,000.

BIDS AND CONTRACTS.

Boston, Mass.: Sealed bids for building Sections E, F and G of the Metropolitan Sewerage System in Brighton, Newton and Watertown, in accordance with the form of contract and specifications to be furnished by the Board of Metropolitan Sewerage Commissioners, will be received by said board at its office, 93 Lincoln street, Boston, Mass., until 12 o'clock M. of Saturday, February 14, 1891. All bids must be made upon the blank forms furnished by the Board. The external diameter of the sewer on these sections is approximately from 5 to 8 feet. Plans can be seen and specifications and form of contract can be obtained at the above office. Hosea Kingman, Tilly Haynes, Robert T. Davis, Board of Metropolitan Sewerage Commissioners of Massachusetts. Howard A. Carson, Chief Engineer.——Sioux City, Iowa: Proposals are wanted until January 13 for the construction of a temporary system of water-works. Address Alderman Cody.——Brooklyn, N. Y.: Proposals are wanted until January 14 for the erection of an armory building for the 13th Regiment. Bids can be for the entire edifice or separate portions. Address Mayor Chapin.——Mount Auburn, O.: Proposals are wanted until January 12 for the erection of a school-building. Address Jacob E. Cormany, chairman of Committee on Buildings.——Springhill, N. S.: Offers will be received till the 20th day of January, 1891, at 6 P. M., for the construction of a water-works system for the town of Springhill, for domestic, fire and other uses, upon the basis of certain proposals, plans, specifications and terms, to be seen at the office of the undersigned, to whom tenders will be addressed under seal and marked "Tenders for Water-works." Daniel McLeod, Town Clerk.——Dallas, Tex.: Bids for rebuilding the Merchants' Exchange are open until Jan. 12. Orlopp & Kusener, architects, Exall Building.——Fort Myer, Va.: Sealed proposals, in triplicate, will be received by the undersigned until 11 o'clock A. M., Saturday, January 31, 1891, when they will be opened, for the construction, at Fort Myer, Va., of one double barracks, two stables, two double sets of officers' quarters, and one cavalry drill-hall. Specifications for the buildings, instructions to bidders, blank forms of proposals, and any other information desired in regard to the work, will be furnished, and plans for the buildings can be examined, on application. Proposals should be indorsed "Proposals for Construction of Fort Meyer Buildings," and be addressed to G. B. Dandy, Deputy Quartermaster-General, U. S. Army, Washington, D. C.——Clarksburg, W. Va.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 20th day of January, 1891, for furnishing the labor and materials required to complete the approaches to the United States court-house, post-office, etc., building at Clarksburg, West Va.,; also for laying earthenware sewer-pipe from building to creek, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the custodian. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Approaches, etc., for the U. S. Court-House, Post-Office, etc., Building at Clarksburg, West Va.," and addressed to Jas. H. Windrim, Supervising Architect.——Washington, D. C.: Sealed proposals for furnishing, delivering and putting in place complete the cast-iron frames, casings and trimmings for doors, windows and washboards in the basement and first story, and the cast-iron frames for doors and windows in the cellar, of the building for the Library of Congress, in this city, will be received at this office until 2 o'clock P. M. on Wednesday, the 4th day of February, 1891, and opened immediately thereafter in presence of bidders. Specifications, general instructions and conditions and blank forms of proposal may be obtained on application at this office. Bernard R. Green, Superintendent and Engineer.——Denver, Colo.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 15th day of January, 1891, for all the labor and material required for the plumbing, gas-piping, etc., for the U. S. court-house, post-office, etc., building at Denver, Colo., in accordance with the drawing and specification, copies of which may be had on application at this office or the office of the Superintendent at Denver, Colorado. Jas. H. Windrim, Supervising Architect.

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BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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IT IS the policy of THE SANITARY NEWS to allow the freest and fullest discussion of all subjects within its province to appear in its columns, but it is understood that any opinions thus expressed are not necessarily the opinions of this journal. Free discussion of any disputed point or undetermined question is the best means of arriving at the truth of the matter involved, and we invite the fullest participation in the discussion of all subjects touching the interest of our readers. In this connection we wish to express our profound respect and admiration for the intelligence of the readers of THE SANITARY NEWS. We are pleased to note the many evidences of a wide appreciation on their part of intelligent discussion, and we are sure articles contributed to this journal demonstrate the ability of the many contributors. Our columns are always open for the expression of opinions and all are welcome to a free use of them.

CHIEF INSPECTOR YOUNG, in discussing the recent fatality on the Burlington railroad, presents a new point of view regarding the smoke nuisance. It was shown before the coroner's jury that the accident was caused, or partially so at least, by the smoke from a passing engine, which so blinded Engineer Hoffman that the accident was the result. This demonstrates that the safety of the traveling public, as well as the comfort, business interests, and health of the city, depends on a strict observance of the instructions of the Health Department and the city ordinances. Railroads are making progress in the matter of smoke prevention, and we have no doubt that under the able and energetic administration of Inspector Young, greatly improved conditions will be observable soon. Inspector Young deserves much credit for the efficient and effective manner in which he has conducted his important office, and we sincerely hope that the city officials will become less negligent in their support of his admirable work.

THE reports of officers and committees of the Chicago Master Plumber's Association published in this issue are of interest. If they had gone no further than to mark the interest that has been taken in association matters, they would not be without value; but, marking this, they will prove an impetus to future labor in a cause that is of destinctive public beneficence. They form another mile-post in the progress of that association to which Chicago owes more than it is conscious of. They mark the records of another year of public benefactions and the promotion of public health. We believe the Health Department will bear us out in the statement that the master plumbers of this city are its most effective agencies in the great conflict in the protection of life and good health. The Sanitary Committee, under the efficient chairmanship of Mr. J. J. Wade, has advanced the cause of sanitation in two continents. This is saying a great deal, but it is true for the intelligent discussion of sanitary matters which Mr. Wade has drawn from the master plumbers of Chicago have been read by the most intelligent and advanced sanitarians of the two hemispheres, and Mr. Wade has great reasons to be satisfied with his year's work. We trust the present year will be as fruitful of good works as the last, and that the advance in plumbing interests and sanitary matters will be as distinctly marked. The relations of plumbing to health is no longer a question of dispute or doubt. The statistics of cities show a marked reduction of the death-rate after plumbing regulations had been adopted by them, and to the master plumbers of Chicago this city owes much of its progress in sanitary matters. We congratulate the Chicago master plumbers on their efficient work of last year, and wish them the fullest measure of success during the year upon which they have entered with such favorable prospects.

COPPER IN CEREALS.

Attention has been quite frequently called to cases of poisoning by lead contained in flour, supposed to result from branding bags with paint containing lead. *The Druggists' Circular* publishes the following case of poisoning from copper:

Serious illness occurring in an infant and attributed to a certain food obtained in the English market, caused a threat of legal proceedings against the manufacturer. The plaintiff's analyst stated that the food contained lead but upon further examination by Dr. Wm. Johnstone, the foreign constituent was proved to be copper, present as a natural constituent of one of the cereals used in the preparation of the food.

Dr. Johnstone in communicating this serious fact to the *Chemical News* points out that the occasional existence of copper in cereals, peas, beans, etc., had long been known, and after an examination of a large number of samples in connection with the matter referred to, he found that 15 per cent. of these samples contained copper in more or less quantity, particularly Scotch barley.

Few soils in Great Britain contain copper to an appreciable extent, and Dr. Johnstone is therefore inclined to attribute the presence of the metal in Scotch barley and in English wheat to the prevalent practice of treating the grain with sulphate of copper and also adding the salt as a dressing to protect the seed from the ravages of vermin after it is sown.

It is easy to see the importance of Dr. Johnstone's discovery, and most persons will agree with him in concluding that some mysterious illness may be accounted for by the unsuspected presence of copper in cereals.

Since the appearance of Dr. Johnstone's note, a correspondent of an English journal points out that a compound sold in that country as "impure sulphate of copper," and containing more iron and probably zinc, than copper, has proved almost if not quite as effective a preventative of smut in wheat as the ordinary

article. The inference is that sulphate of iron alone would answer, and it could be had sufficiently pure to at least greatly lessen the risk of contaminating the grain with a poisonous foreign substance.

NOTES AND NEWS.

There are at least 10,000,000 nerve fibers in the human body.

Quality, efficiency and adaptability are vital considerations in selecting machinery.

The first steel rifle gun forged in this country has just been finished near Troy, N. Y.

Iron bolts exposed to water, in the bridges over the Thames, have, in twenty-five years, been eaten away one-half.

The Plumbers' Co., in London, propose to give the sum of 600,000*l.*, to be used in promoting sanitary technical education.

The Paris Gas Company is said to be the first of the important European gas companies that shows a visible decline distinctly due to the increase of electric lighting.

Seaweed is now made into a tough paper, which takes the place of window glass. When colored the effect is similar to stained or painted glass.

Tests are to be made of the cement deposits found in San Diego County, Cal., to ascertain whether the native is as good as the foreign article, with a view of replacing the latter.

There are at least six plate glass manufacturing companies in the United States, who have an annual product of nearly 12,000,000 feet. This exceeds the entire production of Europe fifteen years ago.

The production of metal aluminum by electrolysis at a cost little above that of tin is what some French chemists are sanguine of being able to accomplish.

An ingenious method of applying drugs hypodermically to the human body in which electricity is brought to bear, is receiving attention.

Celluloid in solution is now being extensively used as a lacquer for all kinds of fine metal works and as a wood varnish, with results that are said to be superior to the old methods.

In a test of steel at the Carpenter Steel Works at Reading, Pa., last week, an inch bar broke at a strain of 233,833 pounds—20,000 pounds in excess of the best record.

Various new applications of electricity are reported from France. It is said that the government military workshops at Mendon are now quite busy with the manufacture of electric motors for the use in ballooning in time of war.

Engineers banking their fires over night should bear in mind the conditions present to assist an increase in pressure that may sometimes become dangerous. The pressure often runs up very high before morning, and this fact is often forgotten.

The utilization of tidal power has for many years exercised the inventive genius of Europeans and Americans. A Mr. Rankin, of Boston, claims to have invented a device which can be worked at an outlay of 75 per cent less than that required by an existing system.

All of the forts and military establishments of Belgium have been connected to Antwerp by telephone. The work was begun in 1881 and was finished last August. Special precautions have been taken to prevent an enemy tapping the wires in war times. The instrument used is a Dejongh microphone.

Up to the present time potassium iodide has been used as a chemical test for ozone, the ozone turning the iodide blue. But a mixture of acids will also turn potassium iodide blue, therefore this is not a reliable test for ozone. We understand that Mr. Ernst. Fahrig, the inventor of a process for the manufacture of ozone from ordinary atmospheric air, has discovered a sure chemical test for the presence of ozone, which he prefers keeping secret for the present.—*Invention*, London.

It seems not unlikely that electricity will be applied to smelting furnaces in the near future. An electrical furnace has been patented in England which is said to have given excellent results in the series of tests to which it has been subjected. The electrodes are blocks of a carbon secured in metal cases, and placed opposite to each other in the walls of the furnace. The metal cases containing the carbons are kept cool by circulating water around them, and the carbons themselves are capable of automatic adjustment to compensate for wear. Provision is made in the furnace for the escape of gas and for the introduction of the charge, and the electromotive force of the current can be varied according to the varying resistance of the charge.

Courtenay De Kalb, writing to the *Nation* from Eastern Peru, says: "Cattle are raised here solely for beef, milk never being used. It appears that in the tropics milk is even more likely to be infected with the bacillus tuberculosis than in the north, and so many cases of consumption have been traced to its use, that the entire population, with scarcely a single exception, leaves it absolutely alone."

The question of the absorption into the skin of solutions by means of electric currents has been, says Dr. S. Ehrmann, of Vienna, the subject with many experiments with me since Prof. Wagner first started the discussion by his researches on the cataphoresis of cocaine; and I have at last hit on a very simple experiment. Take two similar glass vessels, with zinc electrodes at the bottom, and fill with a very weak solution of methyl blue; and if an individual places one of his hands in each vessel, then, when a constant current of 10 to 20 milliamperes is allowed to pass for five or ten minutes, the hand in the anode vessel becomes covered with blue spots, while the other is not marked. The spots appear most on the back of the hand, where the hair and fatty glands are situated. In the palm and around the nails they do not occur.

The souring of milk in thunder storms has just received a scientific explanation at the hands of an Italian savant, Professor Tolomei. He has found that the passage of an electric current directly through milk, so far from souring it, actually keeps it sweet, so that it does not turn until the sixth to the ninth day; when, however, an electric current is passed over the surface of milk it soon becomes sour, and this the Professor attributes to the generation of ozone, since the souring is more rapid when the current passes silently than when it is discharged explosively, more ozone being generated by the former than by the latter method. The fact that the souring of milk can be retarded by so simple a procedure as the passage of an electric current, may prove of practical value and offer a safer way of preserving milk than by the use of antiseptics.

A writer has recently called attention to the unappreciated uses and preservative qualities of soapstone, a material, he says, which possesses what may be regarded as extraordinary qualities in withstanding atmospheric influences, those especially, which have so much to do with the corrosion of iron and steel; and, from experiments made, it is said that no other material is capable of taking hold of the fiber of iron and steel so readily and firmly as this. In China, soapstone is largely used in preserving structures built of sandstone and other stones liable to crumble from the effect of the atmosphere; and the covering with powdered soapstone in the form of paint, on some of the obelisks in that country, composed of stone liable to atmospheric deterioration, has been the means of preserving them intact for hundreds of years.

A writer in the *Nightingale* says: "The sand-bag is invaluable in the sick room. Get some clean, fine sand; dry it thoroughly in a kettle on the stove. Make a bag of flannel about eight inches square, fill it with dry sand, sew the opening carefully, and cover the bag with cotton or linen. This will prevent the sand from sifting out, and will also enable you to heat the bag quickly by placing it in the oven or even on top of the stove. After once using this you will never again attempt to warm the feet or hands of a sick person with a bottle of hot water or a brick. The sand holds the heat for a long time, and the bag can be tucked up to the back without hurting the invalid. It is a good plan to make two or three of the bags and keep them on hand ready for use at any time when needed."

Oliver Wendell Holmes says in the *Atlantic Monthly:* "Let me tell you one thing. I think if patients and physicians were in the habit of recognizing the fact that I am going to mention, both would be gainers. The law I refer to must be familiar to all observing physicians, and to all intelligent persons who have observed their own bodily and mental conditions. This is, the curve of health. It is a mistake to suppose that the normal state

of health is represented by a straight horizontal line. Independently of the well-known causes which raise or depress the standard of vitality, there seems to be—I think I may venture to say there is—a rhythmic undulation in the flow of the vital force. The "dynamo" which furnishes the working powers of consciousness and action has its annual, its monthly, its diurnal waves, even its momentary ripples, in the current it furnishes. There are greater and lesser curves in the movement of every day's life—a series of ascending and of descending movements, a periodicity depending on the very nature of the force at work in the living organism. Thus we have our good seasons and our bad seasons, our good days and our bad days, life climbing and descending in long or short undulations, which I have called the curve of health. From this fact springs a great proportion of the errors of medical practice. On it are based the delusions of the various shadowy systems which impose themselves on the ignorant and half-learned public, as branches or "schools" of science. A remedy taken at the time of the ascent in the curve of health is found successful. The same remedy taken while the curve is in its downward movement proves a failure. So long as this biological law exists so long the charlatan will keep his hold on the ignorant public. So long as it exists the wisest practitioner will be liable to deceive himself about the effect of what he calls, and loves to think are, his remedies. Long-continued and sagacious observation will, to some extent, undeceive him; but were it not for the happy illusion that his useless or even deleterious drugs were doing good service many a practitioner would give up his calling for one in which he could be more certain that he was really doing good to the subjects of his professional dealings.

REPORTS OF COMMITTEES OF THE CHICAGO MASTER PLUMBERS' ASSOCIATION.

REPORT OF THE SANITARY COMMITTEE.

The first element of human happiness is good health, or a sound mind in a sound body. To be successful in life one must command a strong physical constitution, and much more depends upon this than is generally imagined. To be ill, nervously exhausted, or dyspeptically inclined, completely expels all energy from the human system and totally unfits it for the strains required in business pursuits. The time was when the body was considered as an impediment to the more educating faculties of the intellect, hence the care and culture of the body was entirely neglected and sanitary science was regarded as a useless study. During the middle ages this lack of sanitary lore was painfully apparent, and the rusult was that towns and people were in an abominably filthy condition. Filth of all kinds was permitted to remain in and around houses for years, or was thrown into the streets with no thought whatever as to the consequences. In England the floors of rude dwellings were commonly strewn with dried rushes When these became saturated with filth another layer was thrown over the old one until the vast accumulations of years reached the depth of several feet. In other parts of Europe it was possitively unsafe for a decently attired person to pass along many of the streets and thoroughfares, owing to the danger of being deluged with slops thrown from upper windows. There was really no attempt at sewerage or sanitary laws. The indiscriminate refuse of man and animals lay uncared for in the houses and yards, and as a result, plagues, sickness, and typhus disorders swept over the continent, devastating great populations and sweeping away whole villages like chaff before the wind. With prayers and fasting Heaven was importuned for relief, but they never sought refuge in clean linen or discovered the virtues of pure air, pure water good sewerage and plumbing systems.

Cholera counted its victims by the hundred thousands and fever raged with a seeming torrent of annihilation, all due to lax sanitation.

This abuse of sanitary laws should be a warning to those in our day who so furiously denounce everything bearing the name of reform in regard to plumbing, sewerage and water supply, and the necessary cleaning of the cities and towns of this country. I am no alarmist, but I call upon the authorities of this city to examine well the streets, alleys and cellars, and ask themselves if there is no danger from the contagious diseases that are breeding in our midst. The streets of our city are filthy almost beyond endurance. Manure heaps and dirt of every description remain for weeks undisturbed, decomposing in our streets, and with every wind that blows comes destruction to the fibres of human life which finally are obliged to yield to this overpowering influence and succumb to death which steps in,and,aiming at the shattered constitution, strikes the fatal blow which sends to their last resting place many of our best citizens. Enormous taxes are paid to carry on sanitary requirements, but those in authority seem to work only for political aggrandizement rather than for the health of the masses. Since the organization of the Master Plumbers' Association much has been accomplished toward sanitary perfection. The various papers read at the annual conventions have spread throughout the land the advanced ideas of leading sanitarians on the best construction of sanitation in dwellings. Hence, to ignorance can no longer be attributed the lack of efficient sanitary requirements.

During the past year the aim of the sanitary committee has been to bring forth new ideas for the eradication of the evils that creep into this most important of all plumbing interests; and, also, to propagate among our fellow men the value of the inventions that appear almost daily to facilitate a higher degree of excellence in sanitation than has ever before been attained. We have endeavored to select topics which would tend to the consideration of modes that would abolish the many nuisances that give the plumber so much annoyance in the fulfillment of the duties of his calling. By creating subjects for debate we have been enabled to profit by the observations and experiences of one another, which do not amount to mere speculation, but rather to sound, indisputable facts. In this we have acquired knowledge of a more practical nature. We wish to express our most sincere thanks for the earnest attention that has been given the various subjects that have in this way been brought to your notice—a courtesy that not only asserts the moral calibre of the audience, but also gives encouragement to the essayist, who most heartily appreciates this attentiveness. The new year places before us many opportunities advantageously to elevate the standard of our excellence, but before expatiating on this I would draw your attention to a much needed improvement. This improvement is really an absolute necessity. It has been talked about, discussed at length and yet rests without ever having been settled.

Now, gentlemen, I consider it a disgrace and a gross neglect of duty on the part of our members, that nothing has been done toward securing a building for the display of sanitary appliances. When asked to show fixtures in complete working order we find ourselves running here and there, resorting to outside display, when we should have adequate and proper space for all these articles always on exhibition, under the control and management of the Master Plumbers' Association of the city of Chicago. This may also constitute our meeting place and may be a place of interest for visiting craftsmen as well. I trust, then, that the first business taken up by the sanitary committee of 1891 will be the establishment of this convenience, and I would add that it will ever remain a proof of their zealous application which will be rewarded by the gratitude of the whole plumbing fraternity.

The sanitary exhibition for the World's Fair is another important undertaking which requires immediate action. To be successfully accomplished a committee should be appointed to confer with the various local organizations throughout the United States, that this exhibit may be a credit to the master plumbers of this country. Let us take our place among the trades and show that of all progress in this age none has been so marked, no fixtures more complete, and correct devices have never so marvelously sprung into general use as those employed in the sanitary construction of buildings.

We must show the world, and most proudly, too, the mettle of the men engaged in the plumbing business, and I would suggest that we delay no longer the appointment of requisite committees for the Columbian Exposition of 1893.

The next business to be assumed by the association, I would recommend the appointment of a committee to regulate a mode governing the estimations for sanitary work. We are, financially speaking, much below the standard of other tradesmen. Looking about us we behold the comfortable homes reared up as evidences of their industry and prosperity, but the plumber seems to have been so philanthropic in his grand mission in providing for the welfare of the community at large that he has denied himself even the

blessings that the world owes him. The reason for this is in many cases the positive anxiety on the part of the plumber to perform the best possible work at prices that barely pay for the materials consumed. There is no need of this extreme accommodation and it deserves contempt rather than emulation. Before signing cheap contracts, rushing headlong into oftentimes deceptive work, one should take into consideration the enormous cost of labor in these days. Since all work is tested by air or water pressure only the best materials can be used, and only the best workmen are capable of setting up these fixtures. Therefore, it follows that the work of this committee will be most reputable since, by the means laid down, things will become equalized and every one will have a chance.

In conclusion, gentlemen, as chairman of the sanitary committee, I wish again to express our most sincere thanks for the assistance and encouragement you have given us and trust that in the future your efforts will be redoubled and your support more vigorous for the advancement of the Master Plumbers' Association of this, the World's Fair city.

I wish you all a thrice happy new year. May the coming years be full of joy and happiness, and may no shadow of sorrow rest upon yourselves or upon your loved ones.

Respectfully submitted, J. J. Wade, Chairman Committee.

REPORT OF THE EXECUTIVE COMMITTEE.

Mr. President and Members of the Chicago Master Plumbers' Association:

As chairman of the Executive Committee I have the honor to report the work done by it for the year 1890. Evidently the year that is past and gone has not been a year of marvelous growth for our Association, not because there has been no desire on the part of its officers to see it flourish like the green bay tree; not because the genius that was supposed by the ancients to preside over the destinies of man has not been ever present. It is because of the ever fluctuating likes and dislikes of humanity. To-day the prospects are bright and fair for him and to-morrow all his hopes are disappointed. No one can be blamed for this as the period of activity and prosperity rises and falls like the waves of the sea. Our Association rides wonderfully well through all the storms, and our expectancy is that it will float onward until we can rest assured that one effort after another shall be crowned with everlasting success.

During the year the Committee has met from time to time. The first meeting was held in January for the purpose of selecting chairmen of the different committees. The next meeting was held in March to devise ways and means to infuse more life and encourage a better attendance of the members, and also to endeavor, if possible, to add new members to our roll. We recommended, and it was adopted, that the names of several members, dropped from the list, be reinstalled and that an invitation be sent out to non-member master plumbers to attend our meetings free of charge, on probation, and judge for themselves if we were not engaged in a good work, which was worthy of their support and encouragement.

Many of the invited availed themselves of the opportunity and would, we think, have become members if it had not been for a strike of the journeyman plumbers. Unfortunately the spirit of life that was becoming manifest was nipped in the bud. This strike was settled by a special arbitration committee and notice of same was sent to all the members of the Association. The substance of the settlement you all know. Other meetings were held to adjust the claims to right of membership on account of disolution of partnership, and also, to look into the justice of admitting new members into the Association where an objection of a member in good standing was raised against such applicant, all of which questions were reported back to the Association and amicably settled.

Meetings were held in the months of May and June regarding transportation of delegates to and from Denver to attend the National Convention of Master Plumbers. The work of the transportation committee, which Robert Griffith so ably managed, was reported to us from time to time, and all his acts and doings were duly reported and recommended to your body, and adopted. How far-reaching and how much good is derived from money spent in national gatherings, no one dare venture an estimate. Certain it is no local association can stand alone and expect to move the world. Concentration of energy, diffusion of ideas, and one purpose is the axiom of the times we live in. The social part of the history of Denver was well written by Secretary of the Delegation, Jos. A. Alcock. The President, the Recording and the Financial Secretaries were elected from amongst your number.

We had meetings in August, September and October. One of the subjects that came before us was a misunderstanding between two members as to the right of contract and day work. Your Committee presented its opinion on the subject matter in the shape of a resolution, which was adopted, requesting an overhauling and revision of the constitution and by-laws. This resolution was referred to a committee for revision, etc. All of the questions that came before us in our sittings were of importance as they all related to some particular subject. We have aimed to strengthen our Association by way and means which were thoroughly discussed. The many conferences we had have not so far resulted in any definite plan which could be brought before you.

In view of the past experiences of the history of our Association I deem it expedient at this time to say that the wisdom of the sires should be called into service, that the young men and the reserve forces that have been holding back be brought forward to the front. I speak for myself as acting president for some time and I venture to suggest, in all sincerity, that there ought to be an advisory committee appointed by this Association composed of the seven ex-presidents. At the end of the year the first ex-president named on the list be dropped and the next in succession take his place. The object of this committee is not to take the place of the Executive Committee but to vote with it and give advice when called upon by a majority of the Executive Committee.

In looking back over the year that is past in the poetry of my soul I will say the Association flag still waves, that the faithful and loyal still stand hard by.

Death has invaded our ranks during the year. Two of our number have passed away from amongst us; they have passed the bourne from whence no traveler ever returns. "Peace to their ashes." Mr. Esch, though not an active member, was with the fraternity in matter of progression. The Auditorium building was plumbed by him and stands as a monument to his venture and enterprise as a plumber. We regret his loss. Martin Moylan, so well known amongst the plumbers, has left a record that cannot be effaced from our memory. Quick as a flash was he in defence of his opinion, and as quick to retract an error. His seat in our gathering, who can fill? His charities were his alone. We will miss him.

Mr. Hugh Watt, our worthy and honored President, whose hair has grown white in the service, has been unable to be present and preside over your deliberations for nearly five months on account of sickness. We cannot forget the man who has risen above self-interest and left his home once in two weeks to attend these meetings for eight years and done faithful service. May his life of usefulness be prolonged still further.

The cause of sanitary perfection has received new life and vigor in the selection of Andrew Young as chief inspector of plumbing. Those who have complied with and worked in conformity to the new rules have had his commendation. Those who have not have been justly dealt with. Your sanitary committee, yes, its chairman, J. J. Wade, deserves praise for his services and labor of love. The rest of your committee perhaps have done as well as they could. Your warehouse committee, Mr. Griffith, chairman, ever on the lookout, has beaten back the invader of your rights and stands justified in his integrity and uprightness.

I have and hold in my possession the articles you gave me to keep secure. Your insurance on library and furniture is paid for another year. Your funeral badges and your treasures, bonds, are at your disposal. I thank you gentlemen for your indulgence towards me and my inability in not giving the satisfaction I desired as Chairman of the Executive Committee.

Respectfully submitted,

David Whiteford, Chairman.

Hugh Watt, J. J. Clark, C. Breyer, J. Weber, David Bain, A. Irons, M. Mandable, J. J. Hamblin, *Committee.*

REPORT OF PRESIDENT HUGH WATT.

To the Members of the Chicago Master Plumbers' Association:

As the expiration of my term of office has arrived, it is proper

that I should make some kind of a report, which, of necessity, must be brief.

As you are all aware, for the last five months I have been unable to attend the meetings, owing to severe bodily infirmities from which I am still suffering. The association has not suffered anything in consequence, as Brother Whiteford has so ably fulfilled the duties of the office in my absence.

The association is now in a good, healthy condition. From the report of the Financial Secretary and Treasurer, it is stronger in numbers than it was a year ago.

We have lost two by death, Mr. Esch and Mr. Moylan. In the death of Mr. Moylan the association has lost a valuable member. He was one of the earliest members, and always took a deep interest in the affairs of the association—ever ready to uphold and defend the principles of this organization.

From the reports of the various committees, the Sanitary Committee deserves special mention for the great work it has done, and the many able papers it has read before the association. These papers have been published in every sanitary paper published in the United States, England and Scotland.

It sometimes seemed to me that the reading of these papers were not as much appreciated as they might have been by the members, from the fact that so few would turn out to hear them read. It is not much encouragement for one to spend his time to write an article, especially in the case of some of our younger members—who must have spent a great deal of time in gathering statistics and compiling them to make them presentable to the association—to have little more than a corporal's guard to listen to them. After the reading of the paper, a motion is made that the paper be received and placed on file. That is all very well but it would be much pleasanter if made by a full meeting of the association. It would give some encouragement to the writers, and might be the means of bringing out the talent of the young men, of which we have a large number amongst us, if properly encouraged. The chairman of that committee, Mr. J. J. Wade, deserves special credit for selecting the articles and assigning them to the various writers.

The Ladies' Auxiliary deserves a vote of thanks for the handsome manner in which it has entertained the association throughout the year. I hope it will continue to do so during the ensuing year, and treat the new administration with the same courtesy that it has done in the past.

Thanking you all for overlooking all my many failings and shortcomings, it gives me pleasure now to present this gavel to my successor. I hope you will always turn out in large numbers, that he may have opportunity to use it when you get into an old-fashioned, heated debate, as has frequently been heard on this floor in days gone by. HUGH WATT.

REPORT OF APPENTICESHIP COMMITTEE.

To the Officers and Members of the Chicago Master Plumbers' Association.

GENTLEMEN—Your Apprenticeship Committee respectfully offers the following report:

Upon examination of all records of the previous apprenticeship committees to date, we find that there have been placed on the record 630 names, and of this number there are entitled to certificates of journeymenship 319. And to show what interest has been taken in this matter, but 19 have applied for their final certificate. It is very evident that there is much need of reform or improvement in this work of the association. Were the rules governing the apprenticeship question properly lived up to by master and apprentices, it would be of great pecuniary benefit to each, and increase the confidence of the public in our work. We conclude by saying: a "word to the wise is sufficient."

Respectfully submitted, ALEX. W. MURRAY.

HEALTH IN MICHIGAN, DECEMBER, 1890.

For the month of December, 1890, compared with the preceding month, the reports indicate that puerperal fever, cholera infantum, pleuritis, membranous croup, pneumonia, inflamation of bowels, inflamation of brain, measles and whooping-cough increased, and that typhoid fever and scarlet fever decreased in prevalence.

Compared with the preceding month the temperature was lower, the absolute humidity was less, the relative humidity was slightly more, the day ozone and the night ozone were more.

Compared with the average for the month of December in the four years, 1886-9, pleuritis, membranous croup, influenza, puerperal fever, cholera infantum, bronchitis, and cholera morbis were more prevalent, and measles, typho-malarial fever, whooping-cough and typhoid fever were less prevalent in the month of December, 1890.

For the month of December, 1890, compared with the average of corresponding months in the four years 1886-9, the temperature was slightly lower, the absolute humidity, and the relative humidity were slightly less, the day ozone was slightly less and the night ozone was more.

Including reports by regular observers and others, diptheria was reported present in Michigan in the month of December, 1890, at seventy places; scarlet fever at one hundred places; typhoid fever at forty-one places, and measles at thirty-three places.

Reports from all sources show diphtheria reported at five places more; scarlet fever at thirty-two places more; typhoid fever at nine places less and measles at ten places more in the month of December, 1890, than in the preceding month.

HENRY B. BAKER, Secretary.

Lansing, Mich., January 8. 1891.

THE BACK VENTING OF TRAPS.

BY GEO. E. WARING, JR.

The communication of W. A. K., published in your issue of January 3d, is in accordance with the general assumption of health officers and plumbers throughout the country.

It seems to me that this assumption is based on an insecure foundation, and that its effect is injurious to the interests of the community, being always costly, and often dangerous in its results.

The assumption is that unless a trap is back-vented it is sure to lose its water seal by siphonage; and that if it is back-vented, the water seal cannot be withdrawn. Neither of these assumptions is true. Many traps are so placed that they are by no means subject to siphonage, and traps which are necessarily subject to the suction which would produce siphonage may have fresh air supplied to them by a much simpler, less costly and more effective method (McClellan trap-vent), or, which is still better, may be replaced with traps (like the Sanitas and Puro) which no amount of suction and siphonage that can occur in house-drainage can rob of their seal. The use of the back-vent pipe prescribed is by no means always effective in preventing siphonage. If there were a hole in the top of the trap nearly as large as its interior diameter, sufficient air to supply the suction would always enter and prevent the disturbance of the seal. If this hole were connected with a pipe a few feet long, it would still be secure. The larger the hole and the larger the pipe, the longer the pipe may be and still produce the same effect; but in practice we soon reach a point where the inertia of the air in the pipe and its frictional resistance to the movement of air require more suction to set up a current than is required to move the water seal. This has been demonstrated in detail by ample, carefully conducted experiments.

I found in my experiments that under the ordinary conditions of house drainage the free ventilation of the soil-pipe sufficed to prevent unsealing. Mr. Helyer found that with a properly ventilated soil-pipe it took ten discharges of a water closet to cause a small trap connected with the lower point of the soil-pipe to lose less than one-half of its 1¾-inch seal. Mr. Philbrick tried a 2 inch trap on a 2-inch waste with a 1-inch vent-pipe less than thirty feet long. Its seal was 1 5-8 inches. In nine experiments with a discharge through it of a pail of water, it lost its seal twice. Substituting a 1½-inch vent fifty feet long, this trap lost one inch of its seal in five trials out of ten. With a 4-inch trap on 4-inch soil-pipe with 1⅞-inch seal and a vent-pipe 1½-inches in diameter and one foot long, the discharge of a pail of water destroyed its seal three times out of ten. Increasing the vent to two inches, the discharge of six pailfuls broke the seal once and nearly broke it twice. Increasing the vent to three inches, ten pailfuls broke the seal once and reduced it to less than one-half its depth six times. He also says: "Under conditions which indicate perfect security, with a pipe one foot long and one and a half inches in diameter,

on a four-inch trap, a coil of pipe fifty feet long coupled to the vent rendered it inefficient once in eight trials—the trap, having two inches seal, being siphoned in this case—and lost one inch of water three times out of the eight. In another case, where a short vent of one inch in diameter seemed to be quite efficient, a coil of 1-inch pipe, with a length of twenty-eight feet and six inches, being coupled to it, rendered the vent of apparently little use, for the trap lost its seal at every trial." He concludes that with ordinary hopper closets used for emptying slops, "it is diffcult to preserve the seal in the ordinary form of S-trap, even by a vent-pipe attached thereto, unless this be applied directly to the crown of the trap, and be as large as four inches in diameter for at least a foot above the trap."

Putnam, in a long and elaborate series of experiments, reached a conclusion no more favorable, and found that it made a great difference whether the vent pipes were straight or coiled. Short bends are worse than the larger bends of a coil of pipe, and short bends are indispensable in the modern practice of trap venting. Aside from the inefficiency of back-venting as a preventive of siphonage, it has the very serious objection that it brings a current of air into close proximity to the trap, tending to lessen the sealing water by evaporation. This is a serious and constant danger. It may indeed be believed that the existing back-venting of traps, carried out under the plumbing regulations of different towns in this country, result much more often in emptying traps by evaporation than it does in preventing siphonage by furnishing air to the suction.

Then again, the trap vent at the crown of the trap is very liable to become reduced in size, or entirely closed, by the accumulation of sticky matters thrown against it, so that even where a vent-pipe is effective when it is new, it becomes ineffective after a little use. In short, it is an unsafe reliance, and is rarely, if ever, to be depended on with entire confidence.

I venture the opinion that the back-venting regulations would never have attained their wide influence and popularity, had they not opened a field for a great increase of work and profit for the plumber. They increase the cost of plumbing work very much and are an apparent advantage to the trade by which they are supplied. It is not unlikely, however, that the cheapening of house drainage which the abandoning of this system would secure, would ultimately greatly increase the amount of plumbing work to be done. So far as back-venting pipes are made of lead, they are objectionable because subject to injury from the careless driving of nails and from the gnawing of rats, either of which may cause an unsuspected opening between the foul air contained in the drainage system and the interior atmosphere of the house.

I have no hesitation in saying that, in my judgment all ordinances and regulations requiring the back-venting of traps by special pipes communicating with the air above the roof, or with the upper part of the soil pipe, should be abrogated, and that some reliable trap, that will hold a sufficient water seal in spite of any amount or continuance of suction that can be produced in house drainage, should be required to be used in all positions where there is a liability to siphonage.

Geo. E. Waring, Jr.

PLUMBING IN DETROIT.

At a recent meeting of the Board of Water Commissioners of Detroit, Mich., the following circular was authorized and issued to the plumbers of that city:

To the Plumbers of the City of Detroit:

Your attention is called to the fact that in April of the coming year all persons applying for a license to do plumbing will be subjected to an examination as to their ability to perform the work pertaining to their trade. This examination will be more rigid than that of last year, and a more thorough knowledge of how to perform the work of plumbing in all its branches will be required.

Inasmuch, however, as a large number of plumbers do not understand, nor pretend to do, sanitary plumbing, I have received permission from the Board of Water Commissioners to issue what will be known as first and second-class licenses.

A first-class license will grant permission to do all kinds of plumbing whatsoever; and a second-class license will grant permission to do the simpler or more common work of putting in service pipes, and attaching to the same an ordinary hydrant in yard or faucet in kitchen.

The examination will be made in either the first or second class, as the applicant for a license shall himself designate.

It has been found necessary the past year to require that all service pipes shall be laid at least 18 inches away from the wall of the sewer ditch. The plumbers themselves will see the reasonableness of this requirement.

Whenever wood pipe is replaced with iron, the application for a permit must be accompanied by the signature of the party employing the plumber, signifying that it is by their wish and consent. This has been found necessary from the fact that in many cases two or more plumbers have applied for permits for the same places, causing thereby confusion and trouble to the works and to the parties themselves.

You are also notified that the Board has adopted an amendment to section 7, chapter 3, of their compiled regulations, requiring all lead service pipes to be of the kind known and designated as "strong," which will take effect Jan. 1, 1891.

It is hoped that all who desire to apply for a first-class license will take occasion in the intervening months to perfect themselves in such knowledge as is necessary to a perfect understanding of their trade.

Yours respectfully,

L. N. Case, Secretary.

MASTER PLUMBERS OF PHILADELPHIA.

Under date of January 10th, William Harkness kindly sends us the following letter, giving an account of the election of officers in the Master Plumbers' Association of Philadelphia:

Thomas Hudson, Esq.:

My Dear Sir:—The eighth annual meeting of the Master Plumbers' Association of Philadelphia, was held on January 8th, 1891, at their rooms in the Master Builders' Exchange, 18–24 South Seventh street. John E. Eyanson, president, in the chair, and Enoch Remick, secretary.

After the officers of the various committees had presented and read their reports, showing that the organization was in a very prosperous condition, an election was held for officers to serve for the year 1891, resulting as follows: President, John E. Eyanson; vice-presidents, Albert M. Hicks, Geo. F. Uber, J. S. Kite, A. G. Bond, C. L. Parmalee; recording secretary, Enoch Remick; corresponding secretary, Wm. S. Clark; treasurer, William Harkness; board of directors, John E. Eyanson, William Harkness, John J. Weaver, Enoch Remick, Albert M. Hicks, Samuel W. Barnes; sergeant-at-arms, Samuel B. Fleming.

This was followed by the usual annual banquet, given by the association to its members, and judging by the very pleasant social intercourse, the hearty laughter, and the many witty speeches, those present seemed to have enjoyed the good things that had been placed before them. With many hearty wishes for a happy and prosperous new year the meeting adjourned at a late hour.

Very respectfully, Wm. Harkness.

ST. PAUL MASTER PLUMBERS.

W. J. Freaney writes that the St. Paul Master Plumbers' Association has elected officers for the present year and is now prepared to make things hum in the Northwest under the guidance of President J. P. Adamson. We take the liberty to print in full the following letter from Mr. Freaney:

Editor Sanitary News.—The Master Plumbers' Association of St Paul held their regular meeting January 7th in their rooms in the Masonic block. Nearly all of the members of the association were present, and after the dispatch of routine business the following officers were elected for the ensuing term: President, J. A. Adamson; Vice-President, J. H. Shea; Treasurer, P. W. Hudner; Secretary, B. Culleton. Executive Committee: J. T. Holmes, W. J. Freaney, Jas. McDonough. Arbitration Committee: S. A. Dillon, Geo. A. Keys, M. J. O'Neil. Legislative Committee: W. J. Freaney, J. T. Holmes, S. A. Dillion. Sergeant-at-Arms: P. McQuillan.

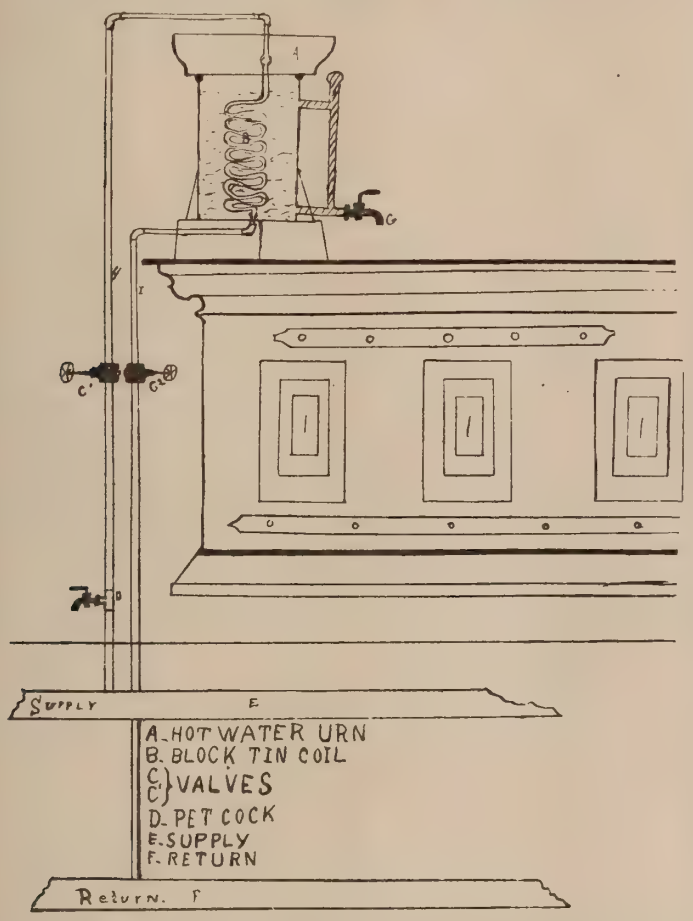
After the meeting adjourned the "Blind Pool" Committee invited the members into the ante room, where the committee had provided a surprise for the association. Mr. Holmes acted as master of ceremonies, and the members responded to his ingenious sentiments. Speeches were made by J. P. Adamson, presi-

dent-elect, and S. A. Dillon, ex-president. Mr. J. J. Dunningan, the veteran of the association, was presented with a very handsome scarf pin in the shape of a horse shoe, studded with rubies and diamonds. Mr. Dunningan was surprised, but after some hesitation responded gracefully, saying that he was proud of the title of "Lone Delegate."

The association is justly proud of the fact that the organization is very prosperous and the members are all enthusiastic in the work of the association. Great things are looked for in the future under the able administration of Mr. Adamson, who is one of the best executive officers in the northwest.

HOT WATER FROM STEAM HEAT.

Editor THE SANITARY NEWS: Having seen, in former issues of THE SANITARY NEWS, sketches and different ideas of plumbers, I beg herewith to hand you the sketch of a heating apparatus which I have lately put in operation in one of our city saloons, for the purpose of heating water for "hot drinks." To me it is a novel idea, and I trust that it may prove of service to some of your readers. You will readily perceive



its operation from the sketch. The pipe H represents the steam supply pipe which takes steam from one of the heating service pipes in the building. This pipe is of the common ⅜ lbs. iron. The coil is of ⅜ block tin pipe, connecting at the bottom with return pipe I. The jet cock, D, I found necessary for removing the water of conduration which prevented the steam from entering the coil in the urn. The valves CC are to close the circulation when desired. When the pipe poures through the bottom of the urn it is made tight by means of a nipple with a running thread soldered into the tin pipe and fastened in place with lock nuts and asbestos with packing. Very truly,

E. H. JERRARD.

LIGHT AND SUNSHINE.

The following, from *The Independent*, is a part of the gospel of health according to the convictions of THE SANITARY NEWS, and its repetition may be the means of letting in more light to some minds as well as rooms:

The influence of light on health is no new topic, and yet it is one as to which we are having constant developments. Chemistry is from time to time revealing what it has to do with the changes that go on in Nature, and how essential it is to important processes in vegetable and animal life. Have you ever watched the cellar potato sprout as it twists its white and sickly branch in search for the window and when it reaches the light begins to extend with new vigor? The sunflower is not alone in turning its disk to the sun, for even the house plants bend their leaves in order to catch the light. Many running vines will turn a corner in order to get where more light reaches them.

It is well recognized that children brought up in close valleys do not thrive so well, and that families through the generations grow smaller in stature and less vigorous in physical and mental force if much excluded from light and sunshine. We have always sympathized with the good father from the plain who came to visit his son when he had removed to another state and into a deep mountain gorge. At family prayers he thanked the Lord that his son was well, although he lived where the sun rose at nine o'clock in the morning and set at four in the afternoon.

One of the chief relations that light has to health grows out of its relation to dampness. It is more and more apparent that a damp soil, a damp house, and a continuous damp atmosphere are not favorable to long continued and exuberant health. Where light is long excluded, there is sure to be dampness. This also favors the growth of cryptogams, fungoids, and all the various forms of low vegetable and insect life. As it is now found that many diseases are caused by, or associated with bacterial or microphytic life, we need to be all the more on our guard against these sources of disease. There are very few, if any, of the pathogenic or disease-breeding germs that flourish in the full light of day. It is not even certain but that artificial light tends to diminish their vitality.

We have no sympathy with that kind of housekeeping which, in order to keep rooms cool, forever shuts out the light from rooms. Better use nets and have a little more warmth. It is not air alone but light that is needed. The craze for sitting in actinic rays, or the blue light treatment which was popular a few years ago, did good in that it led many to spend more time where they could get the full benefit of light. It is the combination of light and air that helps to give vigor and tone to many an invalid, and that makes what is known as the out-of-door treatment restorative to many a sufferer. It is one of the good signs of the time that so many diseases are now being treated in the open air.

HEAT TRANSMISSION.

The following from *The Engineering Record* is abstracted from a paper by Prof. R. C. Carpenter, of Ithaca, N. Y., read at the recent meeting of the American Society of Mechanical Engineers, in Richmond, Va., described some experiments made to ascertain the relative heat transmission through cast-iron plates in the condition left by the foundry, as compared with the same plates treated with dilute nitric acid, for periods of nine, eighteen and forty days. The nitric acid, by dissolving the free iron and not attacking the carbon, forms a protecting coating to the iron, which is largely composed of carbon.

In making the experiments a series of cast-iron plates was obtained, each cast at the same heat and from the same pattern, each measuring 8.4x5.4 inches by 0.45 inches thick. A bottle of concentrated nitric acid was obtained, and two solutions in rain water were made — the first containing 1 per cent. of nitric acid by measurement, the second 5 per cent. of nitric acid. In each of these solutions three of the cast-iron plates were placed. The plates were immersed in a horizontal position, and separated from each other by small blocks at the corners, so as to permit a free action of the acid. The solution was shaken and left for some time in an inclined position, to permit any air beneath the plates to escape.

The following method of testing the relative conducting power of the plates was adopted, after several trials, and proved quite satisfactory. A box was made of boards 1 inch thick, with internal dimensions 8.5 by 5.5 inches and 6.5 inches deep. Near the center of the box, and extending completely around on the inside, a strip of wood ⅝ by ½ inch was rabbeted in place. The top of this strip was made accurately parallel to the top of the box and neatly fitted in place. A gasket of rubber packing was fitted to the projecting top of this strip. Two frames made of hard wood, with a horizontal piece about 1 inch square, were securely fastened

to the box. From the horizontal piece of each frame two braces were set, with the lower ends resting on the plates to be tested. These braces were cut of such a length that by forcing them into nearly a vertical position a strong pressure was made to act on the corners of the plate to be tested, and no difficulty was found in producing a steam-tight joint. The plate to be tested was introduced in the box so as to form a horizontal partition. Into the portion of the box below the plate a ¼-inch pipe was introduced, terminating near the center of the box. This pipe was connected by a rubber hose to a steam supply. On the opposite side and near the bottom of the box was inserted a ½-inch nipple for the discharge of the condensed steam. A thermometer was inserted in the steam chamber and maintained in the same position during all the tests. Water was put in the box above the plate and the heat transmitted through the plate was measured by the increase in temperature of this water.

In making a test the plate was first put in position, the box leveled, and steam turned on in the pipe, with the outlet for water of condensation closed, until it was ascertained that there were no steam leaks around the edge of the plate. Steam was then turned off, outlet pipe opened, the water was added in the chamber above the plate until it passed off in an overflow pipe. Steam was then again admitted through the supply pipe, and as soon as the water above the plate reached a temperature of about 70 degrees, readings of both thermometers were taken, and continued each minute, until the water attained a temperature of about 150 degrees.

The temperature in the steam chamber could not be maintained quite uniform. There was also a slight variation in the degree of temperature at the beginning and ends of the different tests, but not enough to make any material difference in the results attained. The process used being exactly duplicated for each plate tested, gives the comparative transmission of heat for each plate, but does not give with exactness the number of thermal units transmitted, because of our ignorance of the currents existing in the water chamber. Assuming no horizontal currents to exist, the average number of thermal units transmitted per inch of surface is equal to the weight of the water, 3.125 pounds, divided by the exposed surface of the plate, 38.7 square inches, multiplied by the rise in temperature, or 0.0807, multiplied by the rise in temperature of the water.

In the investigation made by Professor Carpenter, the loss of conducting power of the plates immersed in the one per cent. solution of acid varied directly with the time of immersion up to eighteen days, after which it remained nearly constant. Those plates immersed in the five per cent. solution showed a greater loss of conductivity for a short time of immersion, but at the end of forty days the result from either solution was substantially the same.

AMONG THE PLUMBERS.

M. H. Reilly, Jr., ex-vice-president of Illinois, has been making an extended trip throughout the West since the Denver convention. Mr. Reilly has visited all the important places on the Pacific slope, and is now drifting back toward Chicago.

The annual banquet of the Milwaukee Master Plumbers' Association will occur on Tuesday evening, January 20th. We are under many obligations to Secretary Pripps for his kind invitation to be present on this occasion, and will endeavor to join him at the appointed hour.

William Bowers, of New York City, has secured a patent for a very valuable pipe coupling. A circular of the same can be obtained by dropping a line to the inventor.

R. T. Connell, president of the Master Plumbers' Association, of St. Joseph, Mo., spent a few days in Chicago last week, and attended the meeting of the Chicago Master Plumbers' Association. Mr. Connell reports the ascociation at St. Joseph in good condition, and regards it as the best association in the world.

A recent number of the Kansas City *Star* contained the following statement concerning lead pipe thieves in that city: "Numerous complaints have been made to the police authorities of late about the theft of lead pipe from vacant dwellings and business houses. James Williams and Charles Carson were arrested yesterday with over 100 pounds of plumbers' stuff in their possession. They will be prosecuted if any of the local plumbers can identify the material, or locate the places from where the lead pipe had been stolen."

Bauer & Hill, architects, have removed their offices from 94 La Salle street to the Marine building, rooms 30 and 31, corner Lake and La Salle streets.

St. Louis, Mo., is following in the footsteps of Chicago on the smoke nuisance question. An ordinance will soon be introduced in the council requiring every manufacturer to use a smoke consumer, and making a failure to do so a misdemeanor subject to a heavy fine.

Louis Bain, who has been suffering for several weeks with paralysis, has recovered sufficiently to undertake a trip to Georgia, where he hopes to recover his failing health very soon.

The inaugural reception of the employes of Geo. P. Jacobs & Co., of Brooklyn, was held on Friday evening, January 9th, at Arion Hall. A large number of master plumbers were present with their wives and sweethearts, and a very enjoyable time was had by all present. Music and dancing were the features of the evening. For want of space in this issue, a more detailed account will be published next week. The officers were: Geo. W. Hauck, president, and Jas. H. Schultz, secretary. Committee of arrangements: Wm. H. Martin, chairman; J. H. Wills, Charles Hoffmann, and William Garhe.

Harry Black, one of the most popular master plumbers at the Denver convention, was elected, on January 8th, to the office of secretary of the Chicago Master Plumbers' Association for the ensuing year.

President Griffith expects to visit Cleveland and Indianapolis in a short time, in the interest of the National Association or Master Plumbers.

The infringements on the rules and regulations of the Health Department of Chicago during the past week have been made by West Side plumbers. Mr. Stoble, on Ogden avenue, was arrested for doing work without a license, and another plumber in this section of the city was forced to realize the authority of the Health Department for putting in sinks without traps or ventilation of any kind. The latter plumber at first denied that he had done any such defective work, but when confronted with the evidence against him, promised to take out his work and put it in again according to the required rules.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: August Bessler has plans for a three-story addition to the factory at Hastings and Lincoln streets. The same architect has just finished plans for a two-story residence to be built at Maywood and a two-story flat building to be erected at Maywood. West End boulevard and Nineteenth street, eight two-story and basement flat buildings; cost, $33,000. Bloedner & Co. architects. The same architects have plans for a two-story and basement flat building to be erected at No. 444 South Paulina street. Drexel boulevard near Forty-third street, two-story basement and attic residence; cost, $18,000. Troy street near Chicago avenue, two-story flat building; cost, $20,000. George Grussing, architect. Sacramento avenue near Lake street, three two-story flats; cost, $12,000. Same architect. Fifteenth street and Wright, five-story warehouse; cost, $50,000. L. G. Halberg, architect. Oakenwald avenue and Forty-fifth street, three-story and basement double house. Same architect. Calumet avenue and Twenty-fourth street, a four-story and basement flat building. F. L. Fry, architect. 945 West Lake street, four-story flat building; cost, $20,000. Same architect. Ellis avenue and Fiftieth street, two-story, basement and attic residence; cost, $15,000. Frederick W. Perkins, architect. Woodlawn avenue near Fifty-first street, three-story and basement residence; cost, $10,000. Same architect. Ellis avenue and Forty-sixth street, two stone front residences; cost, $35,000. Oliver W. Marble, architect. Grand boulevard, south of Forty-third street three-story residence; cost, $15,000. Same architect. Also working on drawings for a four-story apartment house to be erected on the South side: cost, $200,000. Forty-fifth street and Vincennes avenue, two three-story residences; cost, $13,000. E. H.

Turnock, architect. Nos. 17 and 19 Hinman avenue Evanston, two-story basement and attic residence. W. L. Carroll, architect. The Chicago City Missionary Society will build a chapel 46x103 feet in size. I. K. & A. B. Pond, architects. Sixty-first street, Englewood, a two-story flat building. McCullough & Strock, architects. Congress street, near California avenue, two flat buildings; cost, $12,000. Samuel Halls, architect. Corner of Cypress and Kendall streets, two-story store and flat building; cost, $25,000. I. L. Merriam, architect.——Elmhurst, Ill.: The Northwestern Railway is about to erect a new depot here.——Elgin, Ill.: Architect W. W. Abel, of this city, has plans on the boards for considerable work to be commenced in the spring.——New York City: Fourteenth street between Eighth and Ninth avenues, St. Bernard's church will be rebuilt. J. S. O'Meara is preparing the plans. 90th street near Central Park West, three three-story and basement brown stone residences. G. F. Pelham, architect. 74th street, 300 feet west of Columbus avenue, two six-story flats. Thorn & Wilson, architects. Lexington avenue and 123rd street, five-story brick and stone flat. Andrew Spence, architect. 113th street near Third avenue, two five-story brick tenements and stores; cost, $44,000 Edward Wenz, architect. Twenty-fifth street, East, three-story brick stable; cost, $10,000. Architect, L. Thourard. Broadway, near Thomas street, seven-story brick store; cost, $380,000. S. A. Warren, architect. Eleventh street, East, two five-story brick flats; cost, $24,000 each. B. W. Berger, architect. Seventeenth street, North side, two five-story brick flats; cost, $40,000. Jno. C. Burne, architect. Forty-first street, West, brick theatre; cost, $225,000. J. B. McElpatrick, architect. Derris street, five-story brick flat; cost $22,000. Jno. C. Burne, architect. 112 and 114 Forty-second street, West, four-story and basement brick office building; cost, $225,000. J. B. McElpatrick & Sons, architects. 59-63 Second street, three-story brick church; cost, $65,000. J. C. Cady & Co., architects. 161st street, near St. Ann's avenue two five-story brick tenements; cost, $12,000 each. W. H. C. Hornum, architect. Ludlow street, six-story brick store and tenement; cost; $26,000. H. Horenburger, architect. 319 Twenty-fifth street East, five-story brick flat; cost, $20,000. G. A. Schellenger, architect. 9-11 Allen street, two five-story brick stores and flats; cost, $18,000 each. Wm. Graul, archirect. 34 St. Mark's place, five-story and basement brick store and flat; cost, $24,000. Kurtzer & Rohl, architects.——Brooklyn, N. Y.: Deberoise street near Humboldt avenue, two four-story frame tenements; cost, $11,000. David Acker & Sons, architects. Third avenue and Forty-seventh street, two four-story brick stores and flats; cost, $10,000 each. H. L. Spicer & Son, architects. Third avenue near Forty-seventh street, two four-story brick stores and tenements; cost $20,000. H. L. Spicer & Son, architects.——Buffalo, N, Y.: Seymour and Emslie streets, a church and monastery for St. Patrick's congregation, Rev. Anthony McCarthy, pastor. All improvements, to be of stone construction; cost, $100,000. C. K. Porter & Son, architects.——Pittsburg, Pa.: Mrs. Elizabeth M Yoder will erect a three-story stone dwelling; cost, $15,000.——Baltimore, Md.: Thomas T. Locke has been granted a permit for the erection of thirty-one brick two-story dwellings. The building committee of the Fidelity and Deposit Company of Baltimore, accompanied by Messrs. Baldwin & Pennington, the architects, will make a tour of Eastern and Western cities to examine large office buildings. They will do this with a view of incorporating the best features in the plans for their new $300,000 office building, which they will erect on the lot, northwest corner of Charles and Lexington streets. Architect W. F. Weber has plans for the Hotel Buena Vista and sanitarium to be erected in Franklin county, Pa. F. C. Latrobe is president of the company. To be five stories; cost, $110,000. Wm. F. Weber has plans for manufactory and warehouse to be erected on Pratt street, near Paca street for Leon Lauer; cost, $40,000. Philadelphia, Pa.: Indiana avenue, Fillmore and Ellis streets, five-story factory building. Geissinger & Hales, architects. Arch street near Seventh street, large warehouse. Frank Watson, architect. 1304 Chestnut street, four-story store. A. C. Yates & Co., owners. 134 North Seventh street, large business house. William Reith, owner. Broad and Oxford streets, addition to the Columbia Club building. Harold Godwin, architect. 1233 Chestnut street, extensive alterations and improvements will be made by William Boothby.——Jamestown, Pa. The Fenton Guards of this place are about to erect a new armory.——Ashland, Pa.: Centre Pike, 3 new additions to Miners' Hospital; cost, $15,000; W. D. Hill, architect.—— South Bethlehem, Pa.: The Hun congregation will build a church.——Jersey City, N. J.: Two permits have been issued to the Pennsylvania Railroad Company, one for the construction of the new depot shed, to cost $600,000, and the other for an office building, to cost $78,000. The new ferry house and waiting-room attached to the depot will cost $250,000.—— Fort Payne, Ala.: County court-house. Architects, Chamberlain & Co., Knoxville, Tenn. L. L. Cochran, Judge. ——Slayton, Minn.: Court house. Architect, F. Thayer, Mankato, Minn. C. E. Weld, County Auditor.——Nashua, N. H.: Mayor Beasom recommends the building of a new engine house and the purchase of a hook and ladder truck.——Washington, D. C.: 1031 16th street, a three-story brick building; cost, $25,000. Architect, Bruce Gray. 14th between D and E. streets, three-story brick building; cost, $14,000. C. A. Didden, architect. Architect W. Bruce Gray is preparing plans for an addition and ground entrance to Kernan's Theatre. Premises 1014 Pennsylvania avenue, have been purchased by Mr. Kernan, and he proposes to remove the present building and erect in its place a structure which will extend back to his present theatre. The name of the new theatre will be "The New Lyceum Theatre." Architect N. T. Haller has plans for two three-story brick dwellings to go up on M street between 4th and 5th, northwest. The fronts will be of pressed brick trimmed with stone; cost, about $15,000. Architect James F. Denson has completed plans for a block of seven pretty houses that will be erected on the corner of 30th and P streets, at a cost of $40,000.——St. Louis, Mo.: Southeast corner of Westminister Pl. and Sarah street, a brick dwelling; cost $15,000.——Warrenton, Va.: A large hotel building will be erected to cost $60,000. Fava ,Naeff & Co. Washington, D. C. architects. ——Boston, Mass.: 164-166 Charles street, brick alterations; cost, $19,000. Cabot, Everett & Mead, architects. 375-383 Dudley street, three brick dwellings; cost, $15,000. H. T. Adams, architect. Wereham street, a brick alteration; cost $25,000. J. J. McNutt, architect. Pitt street, corner So Margin a brick stable; cost, $35,000. C. H. Blackall, architect.——Lynn, Mass.: A three-story brick block is to be erected. ——Holyoke, Mass.: The local Y. M. C. A. will erect a $30,000 edifice.——Newton Centre, Mass.: A new passenger station will be erected; cost, $22,000. Shepley Rutan & Coolidge, Boston, architects.——South Braintree, Mass.: A $300,000 station will be erected by the Old Colony R. R. Shepley, Butan & Coolidge, Boston, architects.——Nashville, Tenn.: South Cherry street, four brick stores; cost, $12,000. R. E. Grubbs, architect.——Athens, Tenn.: A ladies' industrial school is to be erected to cost $10,000.——Bristol, Tenn.: New school buildings are to be erected. Address Mayor J. H. Caldwell.——Knoxville, Tenn,: A frame hotel; cost, $10,000. Geo. T. Pearson, Philadelphia, architect.——Canton, Miss.: A new railroad depot is to be erected. —Vicksburg, Miss.: A large ice factory is to be erected. The Standard Oil Company has plans ready for a brick warehouse.——Farmville, Va.: The Prince Edward Lithia Springs Hotel Company has been organized here, with S. H. Loving, of Boston, Mass., president, and J. Martin, Secretary, to build a hotel; capital stock, $100,000.——Charlestown, W. Va.: The Charlestown Mining, Manufacturing and Improvement Company is about to erect a brick hotel.——Sheffield, Ala.: A union depot is to be erected.——Huntsville, Ala.: The Farmers' Alliance is to erect a canning factory at this place.——Bainbridge, Ga.: There is a movement to erect a $20,000 hotel.——Wilkes County, Ga.: This county is to have a new jail.——Louisville, Ky.: 550-560 Fourth street, a brick theatre; cost, $50,000. McElfatrick Bros., architects.——Greenville, Tex.: A college building to cost $20,000, is to be erected ——Abilene, Tex.: A Baptist college is to be erected at a cost of $25,000. Architect Archer has the plans.——Cleburne, Tex.: Plans are being prepared for a $30,000 hotel.——Corpus Christie, Tex.: The Knights of Pythias will erect a $20,000 hall.——Mineral Wells, Tex.: A $75,000 hotel is to be erected. Mount Lynn, Texas: The Boston-Waco Land Company, of Waco, Tex., will build a depot, main building for a hotel, and a sanitarium, at its new town of Mount Lynn.——San Antonio, Tex.: According to a published

statement the Southern Pacific Railroad will erect a $75,000 brick depot here——Ennis, Tex.; Extensive building operations are anticipated for this place in the spring.——Uvalde, Tex.: This place is to have a $10,000 opera house.——Waco, Tex.: Plans have been prepared and subscriptions are being booked for building a natatorium, to cost $40,000.——Bristol, Tenn.: Plans have been made for a chapel and recitation building for King's College. Townsend & Stone, architects.——Atlanta, Ga.: Baptist church will be erected; cost, $80,000. Lamb & Hunt, Chattanooga, Tenn., architects.——Bristol, Va.: A school building will be erected; cost, $12,000. Townsend & Stone, architects.——Chattanooga, Tenn.: Williams and Long streets, school building; cost, $35,000. Frierson & Augier will erect a wholesale store; cost, $100,000.——Bristol, Tenn.: Office and store building will be built; cost, $30,000.——Cincinnati, O.: Architect Gustave W. Drach has plans for ten dwelling-houses; cost, $80,000.——Lawrence, Kansas: The Government Indian schools at this place will be improved during the coming year. Superintendent Meserve has been allowed $40,000 for additional buildings, and has plans completed for a workshop, a large store building, a new stone office, a large stone building for the home of employes, and three cottages.——Topeka, Kansas: Perkins & Adams, architects, have completed plans for a new depot for the Atchison, Topeka, Santa Fe & Pacific Railway Company. It is not as yet decided when the work will begin.——Ellsworth, Kan.: A brick court-house will be built; cost, $20,000.——Leavenworth. Kansas: A proposition has been made to build a city hall here, ——Hamburg, Iowa: The Hamburg Hotel Company will erect a building, to cost $35,000.——Lincoln, Neb.: The subject of building a new city hall is being agitated here. An Episcopal school is to be erected, at a cost of $50,000. J. H. N. Harkins, architect. ——Omaha, Neb.: The Northwestern Shot and Lead Company is erecting a new factory for the manufacture of shot and lead pipe. ——Sioux Falls, S. Dak.: The Milwaukee road will erect a depot at this place, to cost $30,000. D. Ritner, of Washington, Iowa, will put in a carriage-works plant. A Y. M. C. A. building, to cost $40,000, is to be erected here. The Barley Free Library Building will be erected; cost, $20,000.——Salt Lake City, Utah: Corner Third South and Seventh East streets, a two-story brick and stone dwelling; cost, $18,000. J. Hansen, architect.——Mosca, Colo.: This town will have a $50,000 mill, to be erected before October 1, 1891.——Portland, Ore.: A hotel, to cost $60,000, is to be erected by H. H. Northrup.——San Francisco, Cal.: Madison & Burke are to erect a one-story stone building on the north side of Market street, close to the Crocker structure. O. D. Baldwin is about to erect a fine residence on the southwest corner of Spruce and Washington streets. The building will cost about $25,000. The plans are by Samuel Newsom.——San Diego, Cal.: The plans and specifications for a new county jail, to cost $40,000, have been submitted to the San Diego supervisors by Architects Comstock & Trotsche, and the same were accepted.——Milwaukee, Wis.: The Council Committee on Legislature has made the following appropriations: Schools, $250,000; city hall, $200,000; library, $250,000; market hall, $100,000.——St. Paul, Minn.: University, near Rice street, a two-story brick building; cost, $35,000.——Minneapolis, Minn.: Eighteenth and Grant streets, a brick factory; cost, $18,000.——Saginaw, Mich.: A three-story stone city hall; cost, $125,000. E. E. Myers, Detroit, architect.——Albion, Mich.: A three-story brick gymnasium; cost, $20,000.——Detroit, Mich.: Farnsworth street, ten two-story frame residences; cost, $30,000. E. A. Walshe & Son, architects.——Port Huron, Mich.: Architect W. D. Butterfield has plans for a bank and office building on Water street, for the Commercial Bank, to be three stories, of buff and blue stone; cost, $10,000.——Findlay, O.: Main street, a brick and stone building; cost, $25,000. George J. Horn, architect.——Barberton, O.: George T. Pearson has planned a large hotel.——Marianna, Fla.: A $10,000 hotel is to be built at this place.

HEATING AND LIGHTING.

Milwaukee, Wis.: The Shaw Electric Crane Company is about to establish an extensive plant.——Ogden, Utah: Extensive improvements will be made to the local electric lighting plants.——Mullan, Idaho: The Mullan Electric Light and Power Company has been incorporated with a capital stock of $10,000. A. M. Strode can furnish particulars.——New Orleans, La.: The Southern Electrical, Manufacturing and Supply Company, Limited, will hold a meeting on January 30 for the purpose of deciding on a proposed increase of capital stock.——Birmingham, Ala.: The new gas works will cost $150,000.——Lampasas, Tex.: The Lampasas Springs Electric Light and Power Company with a capital stock of $20,000, has been incorporated for the purpose of erecting an electric light plant.——Nashville, Tenn.: The city will petition the legislature for authority to issue $600,000 of bonds for the purpose of either constructing new gasworks or purchasing the present plant of the Nashville Gas Light Company. The Mayor can give further information.——Darien, Ga.: Sinclair Brothers want catalogues and prices on electric light plant. ——Wheeling, W. Va.: F. Barrett and others are organizing a $50,000 stock company to establish a lighting plant.——Cincinnati, O.: The City Council will take no action on electric municipal lighting until the State Legislature has considered the matter of underground wires.—— Columbus, O.: The Clerk of the the Board of Public Works has been instructed to abvertise for bids on 800 or more lights of the same power as those now in use.——Jasper City, Tenn.: The Jasper City Land and Mining Company is endeavoring to secure the erection of an electric light plant.

SEWERAGE NOTES.

Springfield, Mass.: The mayor recommends the employment of an expert to study and report a plan of sewers and drains for that part of the city lying south of Mill river.——Worcester, Mass.: Mayor F. A. Harrington recommends a petition to the general council for leave to issue $800,000 bonds for the extension of the sewerage system, the extension of paving and the erection of new school-houses, fire-engine houses and a new alms-house building. ——Syracuse, N. Y.: The Syracuse Sewer Committee has reported advising an improved system of sewerage in the Fifth Ward.——Athens, Ga.: City Engineer Barnett is now surveying the line for new sewerage system.——Ashtabula, O.: The construction of a system of sewerage will begin next spring. Address H. E. Mann. ——Utica, N. Y.: The city surveyor has submitted a report regarding the sewering of the westerly part of the city, south of the Erie Canal. The report recommends that the state be asked to appropriate $4,500 to build 132 feet of four-foot iron pipe, as a culvert under the canal,and, when such pipe is assured, that the main sewers defined in the map be built.——Ottawa, Ont.: The local press is agitating the question of establishing at once a suitable system of sewerage.——Beverly, Mass.: It is proposed to introduce a new system of sewers.——Savannah, Ga.: The report on the cost of constructing the system of house-drainage proposed for the city estimates the total necessary expenditure at $204,000. The report is now in the hands of the commitee of the whole.——Kansas City, Mo.: Large appropriations have been made for sewer work in this city during the year 1891. Address City Engineer Butts.——Trenton, N. J.: The Board of Health is advocating the immediate construction of a system of sewers for that part of the city south of Assanpink creek. Health Inspector Packer can furnish particulars.——Sioux Falls, Dak.: The city authorities are considering the laying of a system of sewers throughout the entire city, the total cost of which is estimated at $100,000. ——Chattanooga, Tenn.: The Board of Puhlic Works will have the sum of $80,000 to spend on sewer work during the year 1891. ——Williamsport, Pa.: The sewerage question is being discussed by the city officials.——Belleville, Ill.: The city council has authorized the construction of numerous sewers.——Boston, Mass.: Bids for constructing sections E, F and G of the Metropolitan sewerage system in Brighton, Newton and Watertown, Mass., are open until February 14th. Address Board of Metropolitan Sewerage Commissioners.——Oakland, Cal.: Mayor Glascock has approved an ordinance appropriating $3,000 for the First street intercepting sewer.——Knoxville, Tenn.: The estimated cost of the improved sewerage system is $175,000. Bonds will be issued for this amount. ——Manchester, N. H.: More pipe sewers are needed. The mayor in his message states that half of the cost of the sewers should be assessed to abuttors on the streets through which the sewer passes. ——Woonsocket, R. I.: The mayor in his message has recommended that immediate steps be taken toward a complete system of sewerage.——Pawtucket, R. I.: The mayor in his message refers to the pollution of the Pawtucket river by the sewage, and recommends steps for sewage disposal and utilization,——Pitts-

burg, Pa.: The city engineer, Mr. Taylor, has been instructed to prepare plans for a sewer in Berlin alley. Work will not be commenced until April.——Roanoke, Va.: It is proposed to issue bonds for sewers to the amount of $100,000.——Park Ridge, Ill.: Surveys have been made and plans and specifications prepared for a complete system of sewerage, by C. McLennan, C. E., of Chicago, Ill.——Grand Forks, N. Dak.: It is expected to extend the sewer system next season to the amount of about $50,000. W. S. Russell is the city engineer.——Lemont, Ill.: Surveys and plans for a system of sewerage are to be prepared by Vanderlip & Blenkensop, of Chicago. Contracts will be let about April 1.——Kenosha, Wis.: A system of sewerage is projected, and a report on the question is to be made to the city by Mr. John Lundie, C.E., of Chicago, Ill.——Nashville, Tenn.: $65,000 will be expended on a new sewerage system.

WATER-WORKS NOTES.

Pittsburg, Pa.: The project to have a separate water supply for the south side of this city is still under consideration, and it is now proposed to bore 150 artesian wells for that purpose, at an estimated cost of $40,000. A petition asking for the necessary funds with which to proceed with the scheme, is to be presented to the city council.——Allegheny, Pa.: In February a vote will be taken on obtaining a new water supply from Nine Mile Island. The estimated cost of the proposed works is $2,000,000.——Minersville, Pa.: The Forestville Water Company proposes to build works; capital stock, $5,000.——Plymouth, Pa.: It is proposed to make extensive improvements to the plant of the local water company.——Pittsburg, Pa.: An appropriation of $75,000 for a new reservoir is asked for the 1891 budget.——Milford, Del.: Wilmington capitalists have projected works, including pumps and a standpipe.——Lima, O.: An increase in the storage capacity at an estimated cost of $125,000 has been recommended by the water committee. The question must be decided by a popular vote.——Memphis, Tenn.: The Cameron Water-works Construction and Plumbing Company has been organized, with W. L. Cameron, late superintendent of the Artesian Water Company, of this city, at its head. The object is to project, contract for, and build water-works plants in the South, and deal in all material in this line.——Elm Grove, W. Va.: J. H. Rosenberg, Wheeling, proposes to organize a company to bring water by gravity from a spring about one and a half miles from and 150 feet above the village. The estimated cost of a 6-inch supply main and piping the town is $10,000.——Lincolnton, N. C.: The legislature will be petitioned by the town for the right to issue $20,000 of bonds for water-works and other improvements.——Leesburg, Fla.: Water-works are projected.——Scranton, Miss.: Water-works will be constructed.——Hill City, Tenn.: Water-works are projected.——Danville, Ky.: Address the mayor regarding projected water-works.——Roanoke, Va.: It is stated that pipe works will be established. The Secretary of Real Estate Exchange can give information.——Glen Dale, W. Va.: George Adams, Wm. Erskine, D. L. Heiskell and others have incorporated the Glen Dale Company to mine coal, bore for oil and gas, construct and operate electric light plant, gas-works, water-works, etc.——Comanche, Tex.: A system of water-works will be constructed. The mayor can give information,——Mortimer, Tenn.: Brient Bros. want a system of sprinklers for protecting their cotton factory against fire. The building is two-stories.——Franklin, Tenn.: An election will be held at Franklin for the purpose of deciding as to the construction of the water-works previously mentioned.——Birmingham, Ala.: The Birmingham Water-Works Company will hold a meeting in January to consider the issuance of $400,000 additional bonds.——Huntsville, Ala.: The city of Huntsville will petition the legislature for authority to issue $20,000 of bonds, the proceeds to be used for building, repairing and maintaining the water-works, etc. The mayor can give further information. Helena, Ark.: The city will consider propositions for the construction of water-works. W. M. Neal & Co. can be addressed for further information.——Knoxville, Tenn.: The Crystal Water Company is before the council of North Knoxville with a proposition to furnish said corporation with water.——Batavia, N. Y.: The city will vote upon the question of purchasing a new pumping engine for the water-works at a cost of about $10,000.——Memphis, Tenn.: The Artesian Water Company has increased its capital stock from $750,000 to $1,000,000. The increase will be expended in extending the works.——Phillips, Me.: A company will be formed to construct water-works and establish an electric light plant.——Los Gatos, Cal.: The Cold Spring Water Compaay, of Los Gatos, Cal., has been incorporated to introduce water into the town of Los Gatos and Santa Clara county, etc. Directors: George S. Fife, John L. Boone, T. C. Walter, Sydney W. Smith and Philo Mills. Capital stock, $60,000.——Eldora, Kan.: The town council will put in an engine for direct pumping into the mains.——Auburn, Me.: T. E. Eustis is one of a committee appointed to present to the legislature a petition in regard to the city establishing an improved water supply.——Van Wert, Ohio: This place will establish a system of water-works in the early spring.——Ilion, N. Y.: The water-works question is being discussed. Mr. Rasbach can furnish particulars.——Turner, Me.: There is a movement on foot towards estsblishing a system of water-works.——St. Paul, Minn.: The Board of Water Commissioners of this city is advertising for proposals for furnishing certain water-works materials.——Lincoln, Neb.: In the supplementary report made on the water question, the committee recommends that the city advertise for a guaranteed supply daily of at least 5,000,000 gallons of water, and submits the following estimates: Cost of procuring 5,000,000 gallons of water daily guaranteed from one to five years, $25,000; buildings, pumps, etc., $25,000; standpipe or reservoir, $25,000; pipe or 20-inch water main to connect the present city works, $50,000. Estimates for supplying and laying pipe in city, making circuits and finishing up work commenced, hydrants, valves, etc., $100,000. Total, $225,000. The committee's report has been adopted.——Sault Ste Marie, Mich.: An agitation looking towards the improvement of the city water-works has been started. Mayor Otto Fowle can furnish particulars.——Saginaw, Mich.: The city engineer estimates the cost of connecting the east and west pumping stations with a water main, across Saginaw river, at $34,000.——Dubuque, Ia.: It is reported that immediate improvements are to be made to the local water-works plant.——Utica, N. Y.: Alderman Doll and others have been appointed as a committee to confer with the Utica Water-Works Company to ascertain the price of its entire plant and water privileges, with the view of the city purchasing the same.——Phillips, Me.: The people of this place are agitating the question of establishing a system of water-works.——Cincinnati, Ohio: The Board of City Affairs has decided to furnish private consumers with water-meters.——Savannah, Ga.: Reports say that the city council has decided to expend the sum of $60,000 on water-works.——Eustis, Fla.: The Eustis Water and Irrigation Company has been incorporated, for the purpose of establishing a plant.——Alton, Ia: The citizens will petition the council for water-works.——Topeka, Kan.: The Topeka Water Company recently reorganized, with the following named gentlemen as officers: Joab Mulvane, president; J. P. Griswold, vice-president; J. R. Mulvane, president of the bank of Topeka, treasurer, and Jesse Shaw, secretary and manager. George H. Pierson, consulting engineer, has prepared plans for a new pumping station, a standpipe, and twenty-eight driven wells for the company.——Milwaukee, Wis.: The sum of $100,000 has been appropriated by the Council Committee on legislature for the use of the water-works department during the year 1891.

BIDS AND CONTRACTS.

Helena, Mont.: The commissioners of Lewis and Clarke counties, Montana, invite proposals for a county jail, to cost $45,000, to be erected on the present jail lot, in the city of Helena, Montana, specifications, drawings, and all terms to be submitted at a special meeting to be held on Thursday, Feb. 12th, 1891. J. S. Tooker, clerk.——Washington, D. C.: Sealed proposals will be received at this office until 12 o'clock M., on Saturday, January 24, 1891, for constructing in the District of Columbia, concrete sewer, in Edgewood Subdivision, D. C. Blank forms of proposals and specifications can be obtained upon application to the commissioners, together with all necessary information, and only bids upon these forms will be considered. J. W. Douglas, J. W. Ross, H. M. Robert, Commissioners, D. C.——St. Louis, Mo.: Proposals are wanted until February 5th, for constructing two public buildings at Ft. Reno, Oklahoma Territory. Address Post Quartermaster at St. Louis.——St. Paul, Minn.: Proposals are wanted

until January 21st, for furnishing the Water Department with a quantity of brass goods and a quantity of cast iron water pipe. Address John Caulfield, Secretary Board of Water Commissioners.——St. Louis, Mo.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 2nd day of February, 1891, for all the labor and materials required to fix in place complete the low pressure, return circulation steam heating apparatus, high pressure steam boiler, etc., boiler house, coal vault, etc., for the U. S. Appraiser's stores building, at St. Louis, Mo., in accordance with drawings and specification, copies of which may be had on application at this office or the office of the superintendent at St. Louis, Mo. Jas. H. Windrim, Supervising Architect.——West Point, N. Y.: Sealed proposals, in triplicate, will be received until 12 o'clock, noon, on the 9th day of February, 1891, for the erection of a 24-bed post hospital as per plans and specifications to be seen at this office. Inclose proposals in an envelope marked "Proposals for erection of a Regulation Post Hospital," addressed to the undersigned, W. H. Miller, Captain and A. Q. M., U. S. A.——San Antonio, Tex.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 29th day of January, 1891, for all the labor and materials required and fixing in place complete the low pressure, return circulation steam heating and ventilating apparatus required for the U. S. court-house, post-office, etc., building at San Antonio, Tex., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at San Antonio, Texas. Jas. H. Windrim, Supervising Architect.——Fort Myer, Va.: Sealed proposals, in triplicate, will be received by the undersigned until 11 o'clock A. M., Saturday, January 31, 1891, when they will be opened, for the construction, at Fort Myer, Va., of one double barracks, two stables, two double sets of officers' quarters, and one cavalry drill-hall. Specifications for the buildings, instructions to bidders, blank forms of proposals, and any other information desired in regard to the work, will be furnished, and plans for the buildings can be examined, on application. G. B. Dandy, Deputy Quartermaster-General, U. S. Army, Washington, D. C.——Fort Thomas, Ky.: Sealed proposals, in triplicate, will be received until 11 o'clock, A. M., January 27, 1891, and then opened, for construction at Fort Thomas, Ky., of a mess hall, and for the steam heating apparatus and plumbing for same. R. B. Turner, 6th Infantry, A. A. Q. M., U. S. A., Newport, Ky.——Boston, Mass.: Sealed bids for building Sections E, F and G of the Metropolitan Sewerage System in Brighton, Newton and Watertown, in accordance with the form of contract and specifications to be furnished by the Board of Metropolitan Sewerage Commissioners, will be received by said board at its office, 93 Lincoln street, Boston, Mass., until 12 o'clock M. of Saturday, February 14, 1891. Plans can be seen and specifications and form of contract can be obtained at the above office. Hosea Kingman, Tilly Haynes, Robert T. Davis, Board of Metropolitan Sewerage Commissioners of Massachusetts. Howard A. Carson, Chief Engineer.——Washington, D. C.: Proposals are wanted until February 13th, for the erection, etc., of an electric light plant for the Norfolk Navy Yard. Address N. H. Farquhar, Chief of Bureau.——Brooklyn, N. Y.: Proposals are wanted until February 10th for the erection of an armory. Address the Hon I. G. Perry, Albany, N. Y.——Cincinnati, O.: Proposals are wanted untll January 30th, for doing certain public lighting with gasoline for a period of five years. Address Edwin Henderson, City Clerk.

RESTRICTION OF DIPHTHERIA.

Of those who were attacked by yellow fever during the prevalence of that disease in Florida two years ago, only about one in eleven died. In the same year there were 1,422 cases of diphtheria in Boston, of which 470, or one in three, proved fatal. During the last eleven years there have been 14,867 cases of diphtheria in Boston, with an aggregate of 4,825 deaths. In Rhode Island during the last four years there have been about 4,450 of the disease and ninety deaths.

Such a fearful prevalence of this deadly disease, with its incessant desolation of homes, is not by any means necessary. In Glasgow, Scotland, and other cities and parts of some states, its ravages have been greatly checked by means of enforced isolation and disinfection, and there is no reason why boards of health and health officers, if they were armed with the requisite legal power and backed up by a wise public sentiment, might not be able to accomplish a similar result.

Diphtheria is much more fatal than small-pox, and the fact that it is less contagious only increases the necessity of compulsory isolation; for many persons expose themselves unnecessarily to diphtheria who could not be induced by any consideration to expose themselves to small-pox.

It is a fact of public interest that diphtheria does not go from house to house, apart from personal communication. Except in tenement-houses, therefore, the patient can be safely isolated at home, provided the public is duly notified by some simple but familiar signal attached to the door. For such as cannot be safely isolated at home, adequate municipal accommodations should be provided.

The public needs to understand more fully than as yet it seems to do that every case is from a previous case, and that thorough isolation and disinfection would in time stamp out the disease, as completely as a noxious weed would be killed by the destruction of all its seeds.

We must add that in its early stage diphtheria is not readily distinguished from an ordinary sore throat. For this reason every case of sore throat in a child, especially at a time when diphtheria is prevalent, should be looked upon with a degree of suspicion—enough at least to prevent the communication of what may prove to be the dreaded disease. It should be kept in mind, also, that children with sore throats and nasal catarrh are peculiarly susceptible to infection.—*Ex.*

WHAT MR. NORTON SAYS.

Dear Reader: Having read Mr. Morehead's experience plating with gold, silver and nickel, I feel it my duty to inform others of my success. I sent for a plater and have more work than I can do. It is surprising the spoons, castors and jewelry that people want plated. The first week I cleared $37.10, and in three weeks $119.85, and my wife has made about as I have. By addressing W. H. Griffith & Co., Zanesville, Ohio, you can get circulars. A plater only costs $3. You can learn to use it in an hour. Can plate large or small articles, and can make money anywhere. I now have a nice home and bank account, all the product of $3 invested in a plater. S. S. Norton.

Four trains daily by the Monon Route between Chicago, La Fayette, Indianapolis, Cincinnati and all points South. Pullman Perfected Safety Vestibule Coaches on all night trains; Parlor Chair Cars on day trains. For sanitarium resorts visit West Baden or French Lick Springs. The medicinal qualities are curative for all skin and blood diseases. For rates, schedules and any other information, address F. J. Reed, City Passenger Agent, 73 Clark street, or James Barker, General Passenger Agent, Monon Block, Chicago.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

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LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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WHICH is better, to keep out of the fire or cure the burn? Every body would say, keep out of the fire. Then why is it not better to prevent disease than to cure it?

GOOD plumbing in a house is not only a protection against many diseases, but it enhances the value of the property. In fact it is about the most valuable thing about a residence.

PROVIDING cheap plumbing is no saving of money. The amount paid for it may be considered just so much money thrown away, to which should be added doctor bills and other expenses caused by the inferior plumbing.

IF THE extra value which plumbers have given to property by their advancement of sanitary plumbing were in a state to be computed, it would soon be seen that the plumbers have not put it all in their pockets by a good deal.

THERE are certain diseases known to be preventable and the means of preventing them have been ascertained and made known. It now remains to provide some means of getting the public to adopt these means, and appreciate the comforts and blessings of right living.

THE explosion of gas at the corner of State and Jackson streets last Saturday afternoon, by which one person was killed and several badly hurt and much property destroyed, presents very plainly and forcibly another problem to our municipal authorities. Several theories have been advanced regarding the cause of such explosions, and about as many remedies have been suggested. Among the causes presented the two most advocated are the forming in electral wire conduits of sewer gas or the gas by which the city is lighted. The former is probably based on the fact that there have been explosions in sewers when torches have been introduced for the purpose of inspection. It is true that there have been some such explosions, but no serious ones as we now remember. The term "sewer gas" is an indefinite term applied to conditions that arise in sewers and specifies no distinct gas. That a distinct gas exists, which may be properly and definitely defined as sewer gas, is a matter of much doubt. Sewers contain gases which arise from decomposition of animal and vegetable matter introduced into them, and it is probable that illuminating gas finds its way there and is the cause of explosions, as it is very doubtful that an explosive "sewer gas" exists.

Every city in which illuminating gas is used sits on a soil saturated with that highly inflammable and explosive snbstance. An excavation made in the soil at almost any place reveals the presence of this gas. It is well known how difficult it is to lay gas mains so that no gas will escape. Men have been trying to do that for years and yet there is a fortune awaiting the one who will succeed in providing such mains. Conduits afford a kind of collecting reservoir for the gas thus escaping. The volume may be large or small and remain unobserved until ignited in some way when an explosion takes place and the evil for the time is past remedying.

Many remedies for this concealed danger have been suggested, but none have as yet proved efficient. It has been suggested in New York that a counter pressure of compressed air in the conduits overbalancing that of the gas would prevent the explosions whatever be the condition of electrical wires. Others have claimed that proper ventilation would prevent the disasters. In some cities in Germany small pipes are placed in the ground to the gas mains and at intervals along their lines. A smelling committee makes the rounds of these small pipe openings and where the escape of gas is detected the mains are at once repaired. This is done by the gas companies and the object is the saving of gas, and the method is said to be profitable. The solution of the problem is still to be given, but it is one demanding serious consideration.

IN speaking of the influence of diet on character, Oliver Wendell Holmes says in the *Atlantic*:

"Somebody has been writing to me about 'oatmeal and literature,' and somebody else wants to know whether I have found character influenced by diet; also whether, in my opinion, oatmeal is preferable to pie as an American national food.

"In answer to these questions, I should say that I have my beliefs and prejudices; but if I were pressed hard for my proofs of their correctness, I should make but a poor show in the witness-box. Most assuredly I do believe that body and mind are much influenced by the kind of food habitually depended upon. I am persuaded that a too exclusively porcine diet gives a bristly character to the beard and hair, which is borrowed from the animal whose tissues these stiff-bearded compatriots of ours have too largely assimilated. I can never stray among the village people of our windy capes, without now and then coming upon a human being who looks as if he had been split, salted, and dried, like the salt fish which has built up his arid organism. If the body is modified by the food which nourishes it, the mind and character very certainly will be modified by it also. We know enough of their close connection to be sure of that without any statistical observations to prove it.

"Do you really want to know 'whether oatmeal is preferable to pie as an American national food'? I suppose the best answer I can give to your question is to tell you what is my own practice. Oatmeal in the morning, as an architect lays a bed of concrete to form a base for his super-structure. Pie when I can get it; that is, of the genuine sort, for I am not patriotic enough to think

very highly of the article named after the Father of his country, who was first in war, first in peace—not first in pies, according to my standard."

AMEND THE LAW.

The marvelous growth of Chicago has been such that its rapid strides have carried it beyond the provisions and requisites of government measures. A ten year's growth of this city equals in actual progress a period of two or three times that of other cities. We have grown beyond the sufficiency of a few years ago into the pressing necessities of the present and the visible demands of the future. The laws governing a village are not adequate to govern a city, and the laws adequate for the government of a city are not sufficient for the government of a great metropolis. There is no feature in the municipal control of a city of more importance and of greater material interest to its progress and welfare than that regulating its sanitary condition and providing the means for the promotion and preservation of the public health.

It is plainly observable that Chicago has outgrown many of the provisions made for the support and greatest efficiency of the health department. As Chicago has outgrown the possibilities of a few doctors to administer to the unfortunate sick of the city, so has it outgrown the ability of the force of the health department in its laudable and very far successful efforts to prevent disease and promote the health of the people. In this emergency it has been deemed wise to ask the city council to give its consideration to the present pressing needs of the health department in this great work. It has long been admitted that a thorough inspection was the only practical means by which to secure a basis for the intelligent operation and successful efforts of the sanitary servants of a city or state. This is the important work which produces the true state of all sanitary conditions and provides the necessary information on which remedies may be intelligently provided for existing evils. This being true, and the importance of the truth being fully realized, it is desired, in order to provide adequate and efficient service in this branch of the health department, that section 684 of the ordinances governing this department be so amended as to read, italics showing the amendatory words:

"684. Said commissioner shall have and exercise a general supervision over the sanitary condition of the city, and have power to appoint, with the consent of the mayor, an assistant commissioner, a secretary, a register of vital statistics, one health office clerk, three medical sanitary inspectors, five meat inspectors and *thirty-five* sanitary policemen, who shall have full police powers, and perform all the duties of sanitary policemen as are now provided by the laws and ordinances of the city, and such other duties as the said commissioner of health may require and determine; *also twenty-five plumbing inspectors, who shall be practical plumbers, thirty-four factory and tenement inspectors, five female inspectors, a chief inspector, assistant and clerk.*"

Section 686 reads:

"686. It shall be the duty of the commissioner of health to enforce all the laws of the state and ordinances of the city in relation to the sanitary regulations of the city, and cause all nuisances to be abated with all reasonable promptness. And for the purpose of carrying out the foregoing requirements, he shall be permitted at all times, from the rising to the setting of the sun, to enter into any house, store, stable or other building, and to cause the floors to be raised, if he shall deem it necessary, in order to a thorough examination of cellars, vaults, sinks or drains; and to cause all privies to be cleansed and kept in good condition; and to cause all dead animals or other nauseous or unwholesome things or substances to be buried or removed or disposed of as the commissioner of health may direct."

In order that this statute may meet the demands of the present and supply the necessities of the future, it is desired that the following be added thereto:

"And, for the purpose of examining the plumbing, drainage, ventilation and other sanitary arrangements and condition of any building used for habitation or employment, the commissioner of health is authorized and directed to appoint skilled plumbers who have been employed as practical mechanics and proved their reliability in actual work."

The justice and reasonableness of the first amendment lie in its necessity. Chicago is now a metropolis of 1,200,000 population. This vast army of people live in houses and labor in stores, factories, workshops, and offices. All these, in order properly to preserve and protect the health of the people, must be inspected from time to time, and on complaint specific investigations must be made. To the great number of buildings now in the city, 15,000 will be added annually for some time to come; buildings will be remodeled and rebuilt, all of which should be done under the closest inspection in order that the law may be complied with and the health and safety of the people secured. The highest interests and the most sacred rights of the people demand this, and the demand necessitates a sufficient number of efficient inspectors.

Regarding the second amendment, also that portion of the first, relating to the appointment of practical plumbers for inspectors of plumbing, nothing could be more reasonable or of greater importance. Besides, recent practical experience in the appointment of plumbers, has fully demonstrated their most valuable service in this branch of the department, and all acquainted with this service fully appreciate the dangers of dispensing with their efficient services. The inspection service under the direction of Chief Inspector Young has attained a proficiency and perfection limited only by the insufficient number of inspectors. As the law now stands this service could be entirely wiped out by the whim of any mayor who, through ignorance, malice, demagogy or what not might be disposed to do. This suggested amendment should become a part of the municipal code, a mandatory provision of the city's laws. The highest interest of the city demands this and reason cannot oppose it.

Chicago is approaching an epoch in its most wonderful history. The eyes of the world are upon it now, and within the narrow bounds of three years it will undergo the closest scrutiny. Let it be prepared in the matter of health and all its sanitary features and conditions, the highest of all its interests, to acquit itself as ably and proudly as it has ever done in the past. Let its material progress and greatness shine through its beautiful appointments, physical adornments, and its adequate and perfect sanitary provisions.

NOTES AND NEWS.

French parents possessing seven or more children have certain exemptions from taxation.

It is asserted by French vintagers that the grapes gathered at sunrise always produce the lightest and most limpid wine.

The brain of an elephant is remarkably small, not more than one-twenty-third as large as that of a human being in proportion to the weight of both.

The waste products of making paper mixed with fullers' earth are said to form excellent lagging for steam-pipes. It adheres well, and is not easily broken.

Black Sea soundings are said to show that below the depth of 600 feet the water is so impregnated with sulphurated hydrogen gas, emanating from decaying animals and vegetable matter, that living organisms are not found there.

Dr. Russell, senior pathologist at the Edinburgh Royal Infirmary, claims that he has discovered the cancer parasite, which he maintains he has traced to a fungus of the yeast type. He is still pursuing experiments in this department of research.

In France, architects are required to have diploma showing that four years have been spent in technical study. They are held responsible for twenty years for accidents in a building chargeable to their incompetency. They must be present in person or by a representative during the whole construction.

A smoke-preventer for gas globes is the subject of a patent granted to Mr. Edward John Shaw, Astral Works, Hatherton street, Walsall. This smoke-preventer is made wholly of glass, and takes the form of a perforated cover resting upon the top of the globe.—*Invention*, London.

The reason why platinum answers better than any other metal for the leading-in wires of the incandescent lamp is because of its rate of expansion and contraction by heat, which is about the same as glass. Thus the vacuum in the lamp is maintained as it could be by no other metal now known.

A variety of pests often succeed in interrupting telegraphic traffic. In Brazil there is an orchid that incrusts the wire and causes leakage. In Japan the large web of a certain spider, dripping with dew or rain, makes an earth connection, thus short-circuiting the line and interfering with the business.

Modern Light and Heat says it has been demonstrated that telegraphic messages may be sent over the long-distance telephone wires at the same time that they are in use for telephonic communication, without one interfering with the other. This may give the country a telegraphic system which will prove a successful rival of the Western Union.

A steel color is developed on brass by using a boiling solution of arsenic-chloride. A concentrated solution of sodium sulphite causes a blue coloration. Black, as on optical instruments, is obtained from a solution of platinum-chloride, to which tin-nitrate has been added. In Japan brass is bronzed by using a boiling solution of copper sulphite, alum and verdigris.

To illustrate the necessity of air as a component of combustion, Faraday employed this experiment: He saturated cotton wool with any hydrocarbon liquid and set it on fire in a jar of oxygen. The hydrogen in the hydrocarbon attacked the oxygen, burning with a brilliant flame, gradually decreasing as the supply of oxygen grew less, when, suddenly, the cotton wool threw out a dense mass of soot and black flakes in surprising quantities, completely filling the jar. This is exactly what occurs in the furnace of a boiler when combustion is imperfect.

Some experiments have recently been made as to the effect of tight lacing on monkeys. Female monkeys were put into plaster-of-paris jackets, to imitate stays, and a tight bandage put around the waist to imitate a petticoat band. Several died very quickly, and all showed signs of injuries resulting from the treatment. Of course, with the human being, generations of use have bred a tolerance, so that, while we do not find such immediate fatal results, those who are capable of forming an opinion yet know that the constriction of the vital organs of the body caused by tight lacing is continually working mischief within.—*British Med. Jour.*

By some singular instinct, a man who was born blind can tell when he is opposite an object, and can tell whether it is tall or short, slender or bulky. He can also determine whether it be a solitary object or a continuous fence; whether a close fence or an open one, and sometimes whether a wooden fence, a stone wall or a hedge. None of the five senses has anything to do with this perceptive power, but the impressions are made on the skin of the face, and by it transmitted to the brain. He therefore names this unrecognized sense "facial perception." The presence of fog interferes with facial perception and makes the impressions faint and untrustworthy, but darkness is no impediment. A noise which detracts the attention interferes with the impressions. In passing along the street he can distinguish shops from private houses, doors from windows, and whether the windows consist of a number of panes or a single sheet of glass.

The existence of silver in volcanic ashes is of rare occurrence. Only in two cases have argentiferous ashes been met with. The first sample was obtained during an eruption of Cotopaxi in July, 1885, in the ashes of which Mr. J. W. Mallet proved the existence of one part of silver in 83,000 parts of ashes. In the following year the same investigator was able to add a second instance. In January, 1886, a violent eruption of Tunguragua, in the Andes of Ecuador, between fifty and fifty-five miles from Cotopaxi, took place, the eruption continuing at longer or shorter intervals up to November of the same year. The ashes thrown up by this volcano, which had been at rest for over a century, contained silver to the extent of one part in 107,200 parts of ashes. This appears, at first sight, to be only a very small percentage of the metal, but when it is considered what enormous quantities of ashes are erupted, and what a vast extent of area they cover after an eruption, the quantity of the silver thrown up with them must be considerable.

Charcoal in filters has been much recommended for its remarkable power for absorbing organic matter. This porosity renders charcoal, however, whether vegetable or animal, but especially the latter, the most dangerous of all materials for continued use. It becomes saturated with organisms and the matter they feed upon; it cannot be cleaned; and if not daily changed entire or subjected to a red heat—an expense that is out of the question—it will eventually become about as bad as a dead cat in the filter. An admixture of finely-granulated coke is useful, by its lightness, in forming spontaneously a top screen to receive the first straining from the water; and when the united mass of sand and coke is violently agitated for cleansing, with a full pressure of water, the interaction of the contrasted materials has an advantage in scouring effect. At the same time, the coke does not seem to be retentive or receptive of any impurities, as its grains are very hard and sharp. No filth-absorbing material should ever be tolerated in a filter.—*The Sanitary Era.*

INGREDIENTS OF THE KOCH LYMPH.

Following is an extract of Prof. Koch's recent report regarding the nature of his lymph:

Since publishing, two months ago, the results of my experiments with the new remedy for tuberculosis many physicians who received the preparation have been enabled to become acquainted with its properties through their own experiments. So far as I have been able to review the statements published and the communications received by letter, my indications have been fully and completely confirmed. The general concensus of opinion is that the remedy has a specific effect upon tubercular tissues, and is, therefore, applicable as a very delicate and sure agent for discovering latent and diagnosing doubtful tuberculosis processes. Regarding the curative effects of the remedy, most reports agree that, despite the comparatively short duration of its application, many patients have shown more or less pronounced improvement. It has been affirmed that, in not a few cases, even a cure has been established. Standing quite by itself is the assertion that the remedy may not only be dangerous in cases that have advanced too far—a fact which may forthwith be conceded—but also that it actually promotes the tuberculous process, being therefore injurious. During the past six weeks I myself have had opportunity to bring together further experiences touching the curative effects and diagnostic application of the remedy in the cases of about 150 sufferers from tuberculosis of the most varied types in this city, in the Moabit Hospital. I can only say that everything that I have latterly seen concurs with my previous observations. There has been nothing to modify in what I before reported; as long as it was only a question of proving the accuracy of my indications it was needless for any one to know what the remedy contained or whence it was derived. On the contrary, subsequent testing would necessarily be more unbiased the less people knew of the remedy itself. Now, after sufficient confirmatory testing, the importance of the remedy is proved; my next task is to extend my study of the remedy beyond the field where it has hitherto been applied, and, if possible, to apply the principle underlying the discovery to other diseases.

This task naturally demands a full knowledge of the remedy. I, therefore, consider that the time has arrived when the requisite indications in this direction shall be made. This is done in what follows. Before going into the remedy itself, I deem it necessary, for the better understanding of its mode of operation, to state briefly the way by which I arrived at the discovery. If a healthy guinea pig be inoculated with the pure cultivation of German kultur of tubercle bacilli, the wound caused by the inoculation mostly closes over with a sticky matter, and appears, in its early days, to heal. Only after ten or fourteen days a hard nodule presents itself, which, soon breaking, forms an ulcerating sore, which continues until the animal dies. Quite a different condition of things occur when a guinea pig, already suffering from tuberculosis, is inoculated. An animal successfully inoculated from four to six weeks before is best adapted for this purpose. In such an animal the small indentation assumes the sticky covering at the beginning, but no nodule forms. On the contrary, on the day following, or the second day after the inoculation, the place where the lymph is injected shows a strange change. It becomes hard, and assumes a darker coloring, which is not confined to the inoculation spot, but spreads to the neighboring parts until it attains a diameter of from .05 to 1 centimeter. In a few days it becomes more and more manifest that the skin thus changed is necrotic, finally falling off, leaving a flat ulceration which usually heals rapidly and permanently without any cutting into the adjacent lymphatic glands. Thus the injected tuber-

cular bacilli quite frequently affect the skin of a healthy guinea pig from one affected with tuberculosis. This effect is not exclusively produced with living tubercular bacilli, but is also observed with the dead bacilli, the result being the same whether, as I discovered by experiments at the outset, the bacilli are killed by a somewhat prolonged application of a low temperature, or boiling heat, or by means of certain chemicals. This peculiar fact I followed up in all directions, and this further result was obtained—that killed pure cultivations of tubercular bacilli, after rinsing in water, might be injected in great quantities under a healthy guinea pig's skin without anything occuring beyond local suppuration.

Professor Koch here interpolates a note that such injections belong to the simplest and surest means of producing suppuration free from living bacteria. Continuing, he says: Tuberculosis guinea pigs, on the other hand, are killed by the injection of very small quantities of such diluted cultivations. In fact, within six to forty-eight hours, according to the strength of the dose, an injection which is not sufficient to produce the death of the animal may cause extended necrosis to the skin in the vicinity of the place of injection. If the dilution is still further diluted until it is scarcely visibly clouded, the animals inoculated remain alive and a noticeable improvement in their condition soon supervenes. If the injections are continued at intervals of from one to two days, the ulcerating inoculation would become smaller and finally scares over, which otherwise it never does; the size of the swollen lymphatic glands is reduced, and the body becomes better nourished and the morbid process ceases unless it has gone too far, in which case the animal perishes from exhaustion. By this means the basis of a curative process against tuberculosis was established.

Against the practical application of such dilutions of dead tubercle bacilli there presented itself the fact that the tubercle bacilli are not absorbed at the inoculation points, nor do they disappear in another way, but for a long time remain unchanged and engender greater or smaller suppurative foci. Anything, therefore, intended to exercise a healing effect on the tuberculous process must be a soluble substance which would be lixiviated to a certain extent by the fluids of the body floating around the tubercle bacilli, and be transferred in a fairly rapid manner to the juices of the body, while the substance-producing suppuration apparently remains behind in the tubercular bacilli, or dissolves but very slowly. The only important point was, therefore, to induce outside the body the process going on inside, if possible, and to extract from the tubercular bacilli alone the curative substance. This demanded time and toil, until I finally succeeded, with the aid of a 40 to 50 per cent. solution of glycerine, in obtaining an effective substance from the tubercular bacilli. With the fluid so obtained I made further experiments on animals, and finally on human beings. These fluids were given to other physicians to enable them to repeat the experiments. The remedy which is used in the new treatment consists of a glycerine extract derived from the pure cultivation of tubercle bacilli.

Into the simple extract there naturally passes from the tubercular bacilli, besides the effective substances, all the other matter soluble in 50 per cent. of glycerine. Consequently it contains a certain quantity of mineral salts, coloring substances and other unknown extractive matter. Some of these substances can be removed from it tolerably easily. The effective substance is insoluble in absolute alcohol. It can be precipitated by it, though not indeed, in a pure condition, but still combined with the other extractive matter, which is also insoluble in alcohol. The coloring matter may also be removed, rendering it possible to obtain from the extract a colorless, dry substance, containing the effective principle in a much more concentrated form than the original solutions. For application in practice this purification in the glycerine extract offers no advantage, because the substances so eliminated are unessential for the human organism. The process of purification would make the cost of the remedy unnecessarily high.

Regarding the constitution of more effective substances, Professor Koch says that surmises only can be for the present expressed. These substances appear to him to be derivative from albuminous bodies, having a close affiinity to them. The extract does not belong to the so-called group of tox-albumens, because it bears a higher temperature and in dialysis goes easily and quickly through the membrane. The proportion of the effective substance in the extract is, to all appearance very small, and is estimated at fractions of one per centum, which, if correct, shows that we should have to do with matter the effect of which, upon organisms attacked with tuberculosis, goes far beyond what is known to us of the strongest drugs.

Regarding the manner in which the specific action of the remedy on tuberculosis tissue is to be represented Professor Koch says: "Various hypothesis may naturally be put forward. Without wishing to affirm that my view affords the best explanation, I represent the process myself in the following manner: The tubercle bacilli produced when growing in living tissues, the same as in artificial cultivation, contain certain substances which variously and notably unfavorably influence living elements in their vicinity. Among these is a substance which in a certain degree of concentration kills, or so alters, living protoplasms that it passes into a condition that Weigert describes as coagulation necrosis. In tissue thus become necrotic the bacillus find such unfavorable conditions of nourishment that it can grow no more, and sometimes dies. This explains the remarkable phenomenon that in organs newly attacked by tuberculosis—for instanee, in guinea pig's spleen and liver, which then are covered with gray nodules—numbers of bacilli are found, whereas they are rare or wholly absent when the enormously enlarged spleen consists almost entirely of whitish substance in a condition of coagulation necrosis such as is often found in cases of natural death in tuberculosis guinea pigs. The single bacillus cannot, therefore, induce necrosis at a great distance, for as soon as necrosis attains a certain extension the growth of the baciilus subsides and therewith the production of the necrotizing substance. A kind of reciprocal compensation thus occurs, causing the vegetation of isolated bacilli to remain so extraordinarly restricted, as, for instance, in lupus and scrofulous glands."

PLUMBING REGULATIONS FOR THE DISTRICT OF COLUMBIA.

The following is the report of the District Committee for the District of Columbia, also the bill, for the regulation of plumbing in the district:

The Committee on the District of Columbia, to whom was referred the bill (S. 11) to authorize the appointment of a sanitary engineer in the District of Columbia, and for other purposes, respectfully report:

This bill authorizes the commissioners of the District of Columbia—

First. To make, modify and enforce regulations governing plumbing, house-drainage, and other matters of similar nature.

Second. To make regulations governing the examination and registration of plumbers and the practice of the business of plumbing in said district.

Third. To appoint an inspector of plumbing and such number of assistants as they deem necessary, not exceeding four, who are empowered to inspect all houses when in course of erection, and also to inspect, or cause to be inspected, any house in the district, to examine plumbing, drainage, and ventilation of sewers thereof. In brief, the position of inspector, with that of his assistants, is intended to execute the provisions of the act.

The object of the bill is to prevent improper plumbing and sewerage by a system of inspection; also by proper regulation in the examination and registration of plumbers, to prevent incompetent persons from doing work which requires care and skill, and also to provide for the public health by maintaining a proper standard of work. In the judgment of this committee, this bill will subserve a useful purpose. Similar regulations are enforced in the great majority of our cities. In two particulars, however, the committee think the bill should be amended.

First. The minimum penalty provided in section 2 seems to us too large. These fines should be imposed upon persons of very unequal means, and for some who might be guilty of violations of the act, the minimum fine provided, $25, would be oppressive. We therefore recommend that the first section be amended by striking out in line 16, page 1, the words "twenty-five" and insert the word "ten."

Second. As this act cannot go into effect until after the annual appropriations for the district are made, it will be necessary to

make provisions for the salaries of inspectors during the first year. We therefore recommend that section 3 be amended by adding thereto:

"And to provide for the payment of such salaries during the first year, under the operations of this act, there is hereby appropriated the sum of $6,800, or so much thereof as may be necessary; one-half to be paid out of the treasury of the United States, and the other half from the revenues of the District of Columbia."

When so amended, the committee recommend that the bill pass.

Following is the bill:

Be it enacted,etc., That the commissioners of the District of Columbia and their successors be, and they hereby are, authorized and empowered to make, modify and enforce regulations governing plumbing, house-drainage, and the ventilation, preservation and maintenance in good order of house sewers and public sewers in the District of Columbia, and also regulations governing the examination and registration of plumbers and the practice of the business of plumbing in said district; and any person who shall neglect or refuse to comply with the requirements of the provisions of said regulations after ten days' notice of the specific thing or things required to be done thereunder, within the time limited by the commissioners for doing such work, or as the said time may be extended by said commissioners, shall be punishable by a fine of from twenty-five to two hundred dollars for each and every such offense, or in default of payment of fine to imprisonment for thirty days.

SEC. 2. That the said commissioners of the District of Columbia and their successors be, and they hereby are, authorized and empowered to appoint an inspector of plumbing and such number of assistants as they deem necessary, not exceeding four, in and for the district, whose duty it shall be, under the direction of said commissioners, and they are hereby empowered accordingly, to inspect or cause to be inspected all houses when in course of erection in said district to see that the plumbing, drainage and ventilation of sewers thereof conform to the regulations hereinbefore provided for; and also at any time, during reasonable hours, under like direction, to inspect or cause to be inspected any house in said district, to examine the plumbing, drainage and ventilation of sewers thereof, and generally to see that the regulations hereinbefore provided for are duly observed and enforced.

SEC. 3. That the salary of the inspector of plumbing shall be $2,000, and that of each of the assistants $1,200, per annum, payable monthly.

SEC. 4. That all laws or parts of laws inconsistent herewith be, and they hereby are, repealed.

CONTAGIOUS DISEASES.

Prof. Charles A. Lindsley, M. D., Secretary of the Connecticut State Board of Health, concisely formulates in the monthly Bulletin of that Board, definite methods of contracting, and of avoiding the contraction of, contagious or infectious diseases thus:

There is a certain well-defined list of diseases which are commonly known to be "catching." Healthy persons catch them from those who are sick with them. Small Pox, Measles, Scarlet Fever are well known examples of this list. Persons sick with these diseases reproduce in their diseased bodies, the specific infections which made them sick. So that others approaching them receive the infection and are made sick also. Such sick persons can also infect things and places, so that others in contact with such infected things and places, though the sick person be absent, will also receive the infection and be made sick. The above statements are not in dispute—no one questions them—they are settled and accepted facts. It is also true that the only way to acquire any of these contagious diseases is by exposure to the presence of such sick persons or to such infected places or things. It follows as the inexorable logic of these facts, that the spread of these diseases is due to the transmission of the infections which produce them to the persons who catch them; that is, to their exposure to the infected persons, places, or things. And that if persons had not been so exposed they would not have had the diseases.

During the 31 days of last month, (October) nearly 70 persons in this state, mostly children, perished from such exposure. Then again, there were many sick, who did not die, so that probably for the 60 and odd deaths there were 500 or 600 ill, who have fully or partially recovered.

From the known facts about contagious diseases, it will be admitted that none of these cases would have occurred, if the sufferers, mostly children, had not been permitted to expose themselves to these infections. In other words, these deaths were avoidable. Bereaved families need not now be in grief for lost loved ones, or have been anxious about the 500 or 600 sufferers if due precautions had been taken against exposure to infected persons, places and things. But neglect of proper care is almost the universal practice. Boards of health in vain enact regulations requiring parents and physicians to report contagious diseases. Too often both ignor the law or neglect it until a contagious disease has become epidemic in the neighborhood. Houses containing cases of Scarlet Fever or Diphtheria are not closed to the friendly visits of neighbors; indeed the presence of these diseases is often purposly concealed, and there is good evidence that even the physician is sometimes *particeps criminis* in such concealment. And thus the deadly poison of these maladies is allowed to work its fatal effects upon other people. Convalecent children with Scarlet fever or Diphtheria are sent to school or even Sunday school while they are still active centers of contagion. If such culpable disregard of public safety is not a crime against the community, then the careless switchman who derails a passenger train, or the heedless engineer who plunges it into an open drawbridge are not criminals, and incendiarism and burglary are trivial misdemeanors.

THE "FAMOUS" SELF-HEATING PLUMBERS' TORCH.

The accompanying cut represents the "Famous" Self-Heating Plumbers' Torch, manufactured by the Famous Manufacturing Company, of 1100 Ohio aveuue, St. Louis, Mo. It is constructed of heavy cast brass, and very durable. It is compact in shape, and can be held in any position, making it an excellent tool for heating heavy pipe while making a joint, and for thawing frozen pipes in winter. It has no air-pump, no brazed or soldered joints, and produces an intensely hot flame. The torch is a radical improvement over anything heretofore presented. Every oil-tank is tested at 250 lbs. to the square inch, thus insuring perfect safety to the workmen. There are no leaky seams, and all connections are screw-joints. It is simple, durable, and perfectly safe and effective—all the qualities desirable in a torch. For any information address the above firm.

THE TENNESSEE BOARD OF HEALTH.

At a recent meeting of the Tennessee State Board of Health, the following report was presented by Secretary J. Berrien Lindsley:

It may not be amiss at this time briefly to note the scope and worth of the Tennessee State Board of Health.

Of the forty-four states forming the American Union, thirty-four have created Boards of Health. These differ widely in their powers and functions, and also in the means at their disposal for efficient work. Some are merely advisory bodies; others have great executive power. Some are so niggardly endowed as to have only a nominal existence; others are so munificently supported as to be seen and felt through benificent work in every section of their field.

The older states of the Northeast first recognized the value of such agencies for promoting the public welfare. Among these, Massachusetts and New Jersey are prominent, appropriating thou-

sands annually for their support, and in addition printing for distribution among the people large editions of reports and circulars. In no part of America have the objects of such boards met with so great favor as in the new, wide-awake and rapidly-advancing states of the Northwest. The great farming states, especially Michigan, Illinois and Minnesota, may be mentioned as illustrations. The volumes issued by the State Boards of Michigan and Illinois have given those states a national, even more, a European reputation. Michigan and Minnesota are also distinguished for the wonderful co-operation received from local boards, which in each state number fifteen hundred or more.

In every instance where a State Board has been furnished with liberal means, it has found favor with the people, and has become a permanent and valued portion of the state machinery, second only to its kindred branch of public education.

Tennessee has a Board of Health rather peculiar in its structure, capable of furnishing to the state great results at a minimum of cost, as has been tested more than once in its brief history. It is in fact a collegiate body, composed of five medical experts, each proficient in his own department, and of two men eminent in railroad and mercantile circles. Each of these members are at the beck and call of the state whenever their services are needed, and at very moderate cost. In addition, the secretary, who is not a member of the Board, is always ready on a moment's notice to visit any locality upon its order.

Inasmuch as the stated appropriation is only three thousand dollars per annum for all expenses, printing included, it is evident that the draft upon this organization must be limited. The efficacy of the Board is owing to two supplementary enactments. The one, that of 1885, by which County Boards of Health, co-operating with the State Board, were created. The other, a law renewed bi-ennially, placing six thousand dollars at its service in case of epidemic small-pox, cholera or yellow fever. Thus it has the character and value of a Fire Department—always ready for emergencies.

The ordinary work of the Board and the readiness for extraordinary occasions is greatly facilitated by the publication of a monthly bulletin which is systematically circulated throughout the State, and likewise sent to public libraries, boards of health, and similar institutions in all the states as well as to a very large list of exchanges. The bound volumes take the place of annual reports, for which, as yet, there is no statistical material.

This *Bulletin* is also the journal of the State Weather Service, an indispensible agency of all live states which was about to perish five years ago, when this board, recognizing the intimate connection of climatology with their work, saved its life.

Five and a half years' experience fully demonstrates the wisdom of this action. Practically, it has been copied by what is virtually the National Bureau of Health at Washington.

A prominent feature in the *Bulletin* is the publication of truthful vital statistics, without favor or partiality. Of course, with the incomplete and perhaps exaggerated returns from 1885 to 1890, errors were unavoidable. All statisticians understand this. From now on these statistics should be accurate and reliable.

One marked result of the steady circulation of this information has been greatly increased confidence of life insurance companies in Tennessee as a field for their business. A signal instance of this is the erection in Memphis of a noble structure by one of the most noted companies in the world.

Not less noteworthy is the effect of this *Bulletin* in directing the attention of desirable emigrants to our state. One of the greatest treasures Tennessee can boast is its benificent climate. Nowhere else has this life-giving wealth been so well displayed as in the sixty-six numbers of this monthly, steadily sent to those throughout the Union who understand its language and can appreciate its meaning.

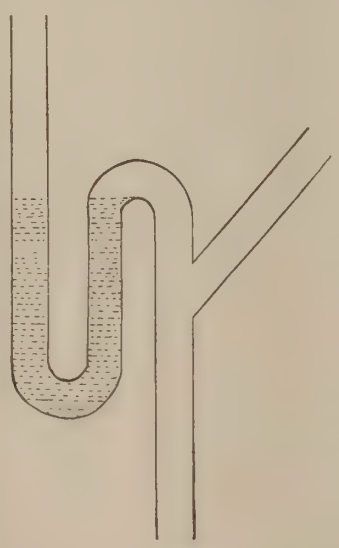
The year 1890 has been remarkably free from epidemic alarms within our own borders. Unremitting vigilance, however, was never more necessary than now. Yellow fever, prevalent in its old *habitat*, threatens the southeastern and southern frontiers of the Union. Cholera from several quarters of the globe may at any time make lodgment in an Atlantic or Pacific seaport, or enter our territory through cities on the Gulf of Mexico or from Canadian ports. Small-pox is just at present creating great alarm in Texas. Tennessee should be alert and ready to stamp it out in case any of the numerous visitors from Texas should bring it with them.

BACK-VENTING TRAPS.

Editor The Sanitary News: In answer to Mr. John F. Jerrard, I will say that I am fully aware of the experiments made by Waring and Putnam, and they say that what they claim is all right according to theory but not practice. Their experiments were entirely on theory and not practice, and Mr. Jerrard thinks as I do about their tests. They were severe, but they had to resort to those means by which they could obtain the results they were looking for. I claim, under ordinary circumstances, that a trap will not loose its seal by evaporation in a week, or a month either. I was inspector of plumbing at the time that Mr. Putnam made his report, and during the time that I held that position, I examined every trap that I found not in use for different periods, and I never found one that had lost its seal by evaporation. I found several that I thought had, but on close examination I found that they had lost their seal by capillary attraction and not by evaporation.

I do not wish to be understood as believing that the seal cannot be broken by evaporation, for I know better, for, according to theory, in time it must, but it will take a long time except under extraordinary circumstances. We can manufacture means by which a trap can be emptied by evaporation in a good deal less time than they say, but would it be practical? I say no, and yet, according to theory, it would be right; so I claim that everything that is right according to theory cannot be put into practice and give good satisfaction.

Mr. Jerrard says that he knows of only one proper way to ventilate a trap and that is from the crown of the trap. Now I claim that, according to my idea, that is an improper way, for, as he says, it brings the air-pipe so close and directly over the seal that the seal is endangered by evaporation; and I claim the vent is endangered also by becoming stopped up with filth thrown up by the action of the water. I claim that the proper place to connect the air-vent is below the crown and above the bottom of the trap, so as to bring the branch on a level with the center of the water in the trap, and the vent should always be taken from the waste-pipe and not from the trap, with a Y branch, as illustrated in the cut.



It is clear to me that by doing this the action of the water passing the air-branch causes the air to start gradually, and relieves the trap and the air-vent of that sudden strain which takes place when the fixture is emptied. I have not received those ideas from theoretical experiments but from practical experience, and my ideas are theoretical and practical. The part of Waring's and Putnam's reports which I think is wrong is, that they are right according to theory but not to practice. W. A. Kelly.

PLUMBING IN HIS TURKEY.

The New York *Tribune*, which some time ago said some very silly and idiotic things about the plumber, tells the following story:

A tall man of middle age went up to a market-stall two evenings ago and began to examine the display of turkeys and chickens.

"Do you wish a large or a small bird, sir?" said the proprietor, persuasively waving his hand toward an extensive array of turkeys of all sizes.

"Well, you see," said the buyer confidentially, "I thought I'd give 'em a good solid dinner at home, and the family's pretty large, so I need a good deal."

"That's right," said the dealer genially, "we have a fine line

of young holiday gobblers. Here is a beautiful bird," he added, taking down a large turkey, "weighs twenty pounds without trimming; nothing better in this city; large, delicious and economical."

After some bargaining and proof of weight, the head of the large family made the purchase and departed with a light heart and a heavy turkey."

The next morning as the dealer in fowls was counting his gains his customer appeared wearing a rather sour expression, and laying a two-pound section of lead-pipe on the counter, he said deliberately: "When I buy a turkey I most generally expect to do the stuffing myself; any way, not have 'em plugged up beforehand. I want to know how you explain that pipe which my wife found in the turkey you sold me last night."

"You say you found this in the turkey?" inquired the dealer, examining the lead with great apparant interest. "Well, it's really remarkable what a healthy turkey will eat; but, my dear sir, you can't expect me to know just what Connecticut farmers fatten their poultry on, can you?"

"Oh, you can't fool me like that," said the angry purchaser of lead pipe. "You stuffed that pipe into the turkey to make it heavy, and you're a fraud!"

"See here, my friend," said the dealer impressively, leaning over his counter, "what is the matter with that bird? Don't it's pipes draw well? Isn't the plumbing in that turkey good? Aren't the sanitary regulations perfect? And yet, when everything about that turkey is A No. 1, and the drainage fine, you come around here and tell me I am a fraud. The trouble is you want too much; but if you think you can come in here and get a whole water-main with a twenty-pound turkey, you're mistaken. Now, get right out of here, or I'll put a lead pipe into you."

And the victim of the heavy-weight turkey didn't want to talk any more, but he hurried sadly away.

A NEW POISON IN CHEESE.*

During the past two or three years we have received at the Hygienic labratory of Michigan University a number of samples of cheese which, it was claimed, had caused nausea and vomiting in those eating of them, and in which we were unable to detect tyrotoxicon. Some of these samples produced vomiting and purging in cats and dogs to which the cheese was fed directly. Of course, the evidence that these samples had been the actual cause of the sickness among the people who had eaten of them was confirmed by the experiment upon the animals; but inasmuch as we were unable to detect the poison, we were compelled to report as follows:

"The poisonous character of the cheese has been proven by experiments upon animals, but we have failed to demonstrate the nature of the poison. Tyrotoxicon could not be detected."

One sample of this class was found by my assistant, Dr. Novy, to be very poisonous. Some of this cheese was covered with absolute alcohol, and after standing in a dish for some weeks the alcohol was allowed to evaporate, then 100 grams of the cheese was fed to a young dog, and caused its death within a few hours. Sterilized milk to which a small bit of the cheese was added, after standing in the incubator at thirty-five degrees C. for twenty-four hours, became so poisonous that 100 c. c. of it introduced into the stomach of a full-grown cat caused death. Dr. Novy made plate cultures from the cheese and from the spleen and liver of the dead animals, and succeeded in identifying one germ as common to both. Sterilized milk inoculated with a pure culture of this germ, and kept in the incubator, proved fatal to cats. But with the advent of cold weather the germ lost its toxicogenic properties, which were not restored by subsequent cultivation in the incubator.

In a second class of samples, the poisonous character of the cheese was not confirmed by direct feeding. Cats, rats and dogs were fed the same quantities as above, without any appreciable effect. The report made upon the samples was as follows:

"Animals fed upon the cheese were not affected. Tyrotoxicon could not be found. The sickness in the people was probably due to some other cause."

The last sentence of this report was probably wrong, as will be shown from the following experiment. Two kilograms of a cheese of this class was extracted repeatedly with absolute alcohol. The part insoluble in alcohol was then extracted within water. The aqueous extract, after filtration, was allowed to fall slowly into three times its volume of absolute alcohol. A voluminous, flocculent precipitate resulted. After twenty-four hours the supernatant fluid was decanted, and the precipitate was dissolved in water and re-precipitated with absolute alcohol; then it was collected and speedily dried on porous plates. A small bit of this precipitate was dissolved in water; and forty drops of this solution, injected under the skin on the back of cats, produced invariably within one hour vomiting and purging. After the partial collapse which followed the vomiting and purging, and which was evidenced by the animal sitting with its chin resting on the floor, recovery gradually followed. The same amount of the solution injected into the abdominal cavity of white rats rendered the animals within ten or fifteen minutes perfectly limp, and the only evidence of life observed was rapid respiratory movements. The rats lay upon their sides, and could be handled without manifesting any attempt at movement. In this condition some died after three or four hours, while others, after lying in this position for from eighteen to twenty-four hours, gradually improved, and after some days seemed to be wholly recovered.

This substance belongs to the so-called poisonous albumins. From its aqueous solutions it is not precipitated by heat or nitric acid, singly or combined. Its solutions respond to the Biuret test. It is not precipitated by saturation with sodium sulphate, nor by a current of carbonic acid gas; therefore, it is not a globulin. It is precipitated by saturation with ammonium sulphate; and this fact removes it from the peptones.

That animals were not affected when fed with the whole cheese may be explained by the supposition that they did not in this manner get enough of the poison to affect them. It cannot be said positively that the samples of cheese of the first class mentioned above owe their poisonous properties to this substance. We have not had the opportunity of testing samples of this class since the recognition of the poisonous albumin in those of the second class. Four samples of the latter have been tested for the poisonous albumin with positive results.

It may be found that traces of this poison exist in all samples of green cheese. This point will be investigated.

It is highly probable that the poisonous effects of some samples of sausage and meat are due to similar products of bacterial activity.

*Victor C. Vaughn, M. D., in the *Medical and Surgical Reporter*.

THE CHICAGO MASTER PLUMBERS.

The first meeting under the regime of the new officers of the Chicago Master Plumbers' Association was held on Thursday evening, January 22d, in Grand Army Hall.

President David Whiteford called the meeting to order.

On motion, by Mr. Young, the first vice-president was invited to take a chair on the platform at the right of the president during the meetings of the present year. At the request of the president Mr. Corboy was escorted to the rostrum by Mr. Young. Mr. Corboy made a neat little speech exhorting every member to place his shoulder at the wheel and help make the association more prosperous during the coming year than it had ever been before.

The newly elected recording secretary, financial secretary, treasurer and sergeant-at-arms were escorted to their new posts of duty by their respective predecessors.

The minutes of the last meeting were duly read and approved.

The treasurer made his final report, and the auditing committee verified the accounts.

The executive committee reported the names of the chairmen of the standing committees for the ensuing year, which are as follows: Arbitration committee, R. Coleman; apprenticeship committee, J. Roche; conference committee, T. C. Boyd; sanitary committee, M. L. Mandable; auditing committee, C. Breyer; warehouse committee, R. Griffith; license committee, J. J. Wade; legislative committee, P. Sanders and M. Ryan; library committee, T. P. Culloton.

Mr. Murray read a report on contract work, which is soon to be read before the National Association of Builders in New York, and requested amendments to the document.

On a motion, by Mr. Boyd, a unanimous vote was taken against sub-contract work.

Mr. Byrne made a motion that the financial secretary notify the members who are in arrears with their dues that unless they pay up by the last of March their names will be dropped from the roll.

At the close of the meeting the beautiful engrossed resolutions of the Chicago Master Plumbers' Association, concerning the death of Martin Moylan, were presented by the committee. The family of the deceased will be presented with these resolutions, a copy of which, together with the addresses delivered at his funeral, will be published in the next issue of THE SANITARY NEWS.

NEW YORK MASTER PLUMBERS.

The following letter was received from James A. Macdonald concerning the recent election of officers in the New York Association:

MR. THOMAS HUDSON. *Dear Sir*—The enclosed ticket was unanimously elected at a regular meeting of the Master Plumbers' Association of New York City, on Tuesday evening January 13th 1891: President, H. G. Gabay; First Vice-President, Frank Reynolds; Second Vice-President, William R. Bracken; Third Vice-President, William H. Quick; Financial Secretary, T. J. Tuomey; Secretary, Wm. McDermott; Treasurer, J. N. Knight; Sergeant-at-Arms, C. H. Kranichfelt; Trustees—George D. Scott, James Gilroy, James Muir, John Byrns, Jos. A. Macdonald. Auditing Committee—John Ford, Jno. McCarron, David Mackay, Jr. License Committee: John Montgomery, William Young, Joseph W. O'Brien. Apprentice Committee—Ed. Murphy, Jno. S. Dunn, Terence McCormack, John Mitchell, T. J. Cummins.

KANSAS CITY MASTER PLUMBERS.

R. S. Kirtley, Secretary of the Master Plumbers' Association of Kansas City, writes as follows:

EDITOR SANITARY NEWS. *Dear Sir*—At a regular meeting of the Master Plumbers' Association of Kansas City, Mo., held January 13th, 1891, the following officers were elected to serve the ensuing year: President, L. B. Cross; First Vice-President, R. B. Farley; Second Vice-President, D. M. Quay; Treasurer, John McDonnell; Secretary, R. S. Kirtley; Sergeant-at-Arms, W. G. Ashdown.

AMONG THE PLUMBERS.

The Sanitary Silex Company has been incorporated at Baltimore, Md., to manufacture patent pipes for the walls of buildings. W. M. Dunnett, N. M. Rittenhouse and S. W. Register are interested. The capital stock is $100,000.

Mr. Madden, of the firm of Madden & Cox, Ft. Wayne, Ind., visited the Health Department of Chicago this week and secured a copy of its rules and regulations governing plumbing. He will remain in the city several days picking up new ideas in the plumbing line.

There is a movement on foot among the master plumbers of Duluth, Minn., to secure an ordinance governing the plumbing of that city.

Mr. J. Huber, the architect for the *Evening Post* building, has moved his offices to its new building on Washington street.

An account of the many banquets among the master plumbers this week will appear in our next issue.

The steam-fitters of Chicago, who have been on a strike for so long a time, have recently sent a protest to the common council against the employment of non-union steam-fitters on work being done for the city. They threaten to deal very harshly when the proper time comes with all aldermen who place themselves on record as opposed to the proper recognition of organized labor.

The plumbers' helpers of Duluth, Minn., have elected their yearly officers. Phillip McGraw will wield the gavel and William McEwen will record the minutes of their deliberations.

The Self-Cleaning Boiler and Tank Co., of Philadelphia, has a very fine exhibit at the Institute of Building Arts, 65 Washington street, Chicago.

In our issue of the 17th, through some oversight, errors crept in the article by E. H. Jerrard on "Hot Water from Steam Heat." "Condensation" showed up as "Conduration," "jet cock" for "pet cock" and "pours" for passes." These errors, of course, are readily observed by the reader, and, while the sense is not destroyed, such errors are annoying whatever their cause. In order to make this matter right we promise Mr. Jerrard to interview one of his heaters as soon as we can find him in due proximity to the proper invironments.

The Youngstown Plumbers' Union have elected the following officers for the ensuing year: John Little, president; Vinnie Laughlin, vice-president; W. H. Lewis, secretary, and W. H. Burnett, treasurer.

Discontent has arisen among the Chattanooga, Tenn., journeymen plumbers, who think they are entitled to $3 per day instead of $2.50, the price they have been receiving in the past. They demand that their terms be complied with on and after February 1st, 1891.

The Detroit Lead Pipe and Sheet Lead Works have about completed their new catalogue, a copy of which can be secured by addressing E. A. Morris, secretary and treasurer of the company.

Salt Lake City is boasting of a fine display of plumbing goods by the Utah Plumbing and Supply Co., which has its headquarters in the old skating rink on West Temple street.

With twenty-five practical plumbing inspectors the Health Department of Chicago can protect the health of the citizens of this great city in a very satisfactory manner.

The National Water Tube Boiler Company, with a captial stock of $100,000, will manufacture tube boilers and steam generators and appliances at New Brunswick, N. J.

Brooklyn, N. Y., has a new plumbers' and steam-fitters' supply company which will do business under the firm name of The Brooklyn Sanitary Supply Company. The capital stock is $10,000 and the incorporators are John W. Newberry, Richard Hassard and Edgar E. Salmon.

The delegates to the Denver convention who had the good fortune to meet Robert Gibson will be glad to learn of his achievements in the line of inventions. A description of his patent flush tank and water closet can be obtained by dropping him a line.

The officers of the journeymen plumbers' union, at Columbus, Ohio, for the ensuing year will be Louis Baumann, president; Chas. Engler, vice-president; Edward Beck, secretary; Peter Gehr, treasurer; Fred Trautmann, guardian; George J. Powell, guide; Henry Trautmann, John Harris and Edward Wolf, trustees,

The J. H. Case Plumbing Company has been incorporated at Green Bay, Wisconsin. The new firm opens its shop in the Hagemeister building. J. H. Case is the main factor in the company.

Mr. David Whiteford, the newly elected president of the Chicago Master Plumbers' Association, is very busy oiling the machinery of the new administration, and there is every promise of a prosperous year in the association.

The New York Master Plumbers' Association will initiate the new officers of the association by giving a grand ball at the Lenox Lyceum on the evening of January 28th. Music will be furnished by Cappa's Seventh Regiment Band. The names of the committeemen who have charge of the arrangements, need only be mentioned to assure all those, who have ever attended a society event of the New York Master Plumbers, that the festivities on this occasion will far surpass any ever given by this noted order of the craft. The committee consists of H. G. Gabay, John Mitchell, T. J. Tuomey, J. A. Rossman, William R. Bracken and T. J. McCormack.

The Cincinnati Master Plumbers are preparing for a grand entertainment to be given in honor of the meeting of the Executive Committee of the National Association of Master Plumbers, in that city next week. On Wednesday evening, Jan. 28th, a musicale will be given, which will be followed with the usual banquet that plumbers never fail to enjoy. The Executive Committee will, on this occasion, obtain a taste of what awaits them next June at the convention of the National Association.

At a meeting of the journeymen plumbers held on January 19, in Plasterers' hall, an ordinance was outlined providing for the appointment of fifteen more plumbers in the city health department. The ordinance will be presented to the city council within the next month. As an argument for its adoption it is said that the present number of the skilled plumbers is inadequate, and that it is almost necessary to slight some of the work. Last year there were 10,000 buildings erected in the city, each one of which

had to be examined as to its plumbing and sanitary condition. With the large number of buildings that will be remodeled within the next year it becomes necessary to increase the number of inspectors. Buildings that were originally intended for some other purpose will be changed into hotels or lodging houses to accommodate visitors to the world's fair. It is claimed that the present force of inspectors is totally insufficient. The plumbers having a natural pride in the sanitary condition of the city advocate the appointment of fifteen new inspectors.

The New York Master Plumbers are agitating the question of erecting a building of their own. They hope to form a company with a capital stock of $20,000 of which amount about $8,000 has been subscribed. The New York plumbers are very progressive and there is little doubt but that they will succeed in their recent undertaking.

Geraghty & Sproul, 356 Third street, Hoboken, New Jersey, were robbed on the morning of January 12th, and as the thieves were making away with a wagon load of plumbing materials policemen Harrington, Cox and Harney overtook them and placed them under arrest. Their case came up before Judge Stilsing, who fixed the bail at $7,000. It seems that these thieves are the leaders of a gang of burglars who have been committing bold robberies in Hoboken for several months past, and it is hoped that their arrest will put a stop to the depredations in this locality for some time to come.

The first reception of the employes of George P. Jacobs & Co., of Brooklyn, occurred on the evening of the 9th inst. Arion Hall, on Wall street, near Broadway, and the handsome ballroom was comfortably filled with a pleasant party of the craftsmen and their friends. Business cares were laid aside for the time being and the energies of those present were devoted toward having a good time. That they had it was apparent to even the casual observer. Interest did not lag for a single moment, and as regularly as the band played the floor was covered by the dancers. This harmonious and agreeable state of affairs continued all through the night and only ended with the last dance on the admirably arranged order at an early hour next morning. By that time the throng felt as if they had enjoyed one of the best evenings in their recollections and were willing to depart for their respective homes. The affair showed that most careful preparations had been made for it. Everything passed off in the best possible manner. The hall was decorated in an elaborate manner. Potted plants and exotics lined the front of the stage, in the center of which was a huge arch, beautifully designed in lycopodium, with the words "George P. Jacobs & Co's Employes" worked in in small white flowers, Surrounding this was a vase composed of vari-colored roses, lilacs and other flowers. From each of the half-dozen or more chandeliers were suspended baskets of plumes and fancy grasses, while the four walls were festooned with fern. About 10:30 o'clock, Floor Manager Frank L. Simmons, blew his whistle, which was a signal for the opening march to begin. He, accompanied by his wife, led the long line of couples through a series of evolutions in a most capable manner. Immediately after the promenade sets were formed and the fun commenced in earnest. The handsome standard bearer, who modestly declined to wear the pretty badge presented to him, added interest to the occasion by his presence and watched his employes enjoy themselves with undisguised pleasure. Though he did not participate in the festivities beyond this, it is safe to say that he found them equally as pleasant as those around him. President George W. Hauck took an active part in the affair, and, while looking after the comfort of the organization's guests, he also took part in a majority of the dances on the programme. A word should be said in praise of the ladies also. They were on hand in goodly numbers and in charming costumes, lending grace and elegance to the occasion. The association had among its guests representatives from different firms throughout the city, and all were looked after in its characteristic style. There were twenty-three numbers on the order beside the overture, consisting of lanciers, quadrilles, waltzes, schottisches, gavottes, polkas, yorkes, etc., and each was accompanied by appropriate musical selections, including popular and classic airs. It was, as stated, the first reception given by the organization and its success was all the more marked. Adding to the success and charm of the evening were the attentive services of the gentlemen who composed the following committees: Floor, F. Simmons, J. H. Schultz, W. B. Wills, William Garbe, C. Valentine, J. McElravey, C. Jarnow, George Evans. Reception, John Mahoney, William Griffin, John Redden, Edward Wieman, F. Shields, James Kearns, John Conway, George Reinold, Thomas Mahoney. Arrangements, William H. Martin, J. H. Wills, William Garbe, Charles Hoffman. The officers of the organization by which this delightful reception was given, are: George W. Hauck, president; James H. Schultz, secretary; J. H. Wills, treasurer. There were harmony and good cheer throughout the very enjoyable evening, and future occurrences of this reception will be looked forward to with much pleasure.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago: Oak Park High-school building, corner of East avenue and Lake street; cost, $40,000. Thomas & Rapp, architects. The same architects have plans for a residence to be erected on Drexel boulevard, near Forty-third street; cost, $25,000. They are also making alterations and adding one story to three wholesale stores on Fifth avenue and Monroe street; cost, $20,000. Shields avenue and Twenty-seventh street, two four-story warehouses; cost, $25,000. Same architect. Twelfth street and Sacramento avenue, four-story store and flat building. Ruehl & Hildinger, architects. West Forty-eighth street and Della, two-story store and hall building. Same architects. Millard avenue, near Ogden avenue, three-story flat building. Same architects. Robey street, corner of Walnut, two-story flat building. Same architects. Clark and School streets, a three-story flat building; cost, $30,000. L. G. Halberg, architect. Sixty-ninth street and Vincennes avenue, three-story stone-front store and flat building. E. W. Brown, owner. Morgan Park, two-story residence. F. L. Lively, architect. Maywood, ten two-story frame houses. Thomas Scott, architect. Warren avenue, between Hoyne and Leavitt streets, two-story dwelling. Lake avenue, near Thirty-ninth street, block of five-story apartment houses. L. B. Dixon, architect. Calumet avenue, between Thirty-eighth and Thirty-ninth streets, eleven two-story residences. John T. Long, architect.——Edwardsville, Ill.: The city will issue bonds for $200,000 for new county buildings.——Roodhouse, Ill.: The Chicago & Alton will erect a $30,000 depot here.——Dubuque, Iowa: The Board of Supervisors will soon want proposals for the erection of a new court-house.——Salt Lake City, Utah: Main street, a three-story brick store building; cost, $40,000. Carroll & Kern, architects.——Fair Haven, Wash.: A new opera-house is to be erected.——New York City: Fifth avenue and Twenty-eighth street, a theater building will be erected. Francis H. Kimball, architect. Eighty-fifth street and West End avenue, six-story brick and stone apartment house; cost, $45,000. G. A. Schellenger, architect. Madison avenue and 89th street, seven-story fire-proof hotel; cost, $200,000, Thomas Graham, architect. Corner of Central Park, west, and 72d street, fourteen-story hotel. 92 Chambers street, five-story and basement brick and stone business building; cost, $30,000. Market and Water streets, six-story brick and stone hotel; cost, $45,000. George E. Harding, architect. 113th street, near Third avenue, two five-story brick flats; cost, $44,000. Edward Wenz, architect. 119th street, near Eighth avenue, three five-story brick flats; cost, $54,000. F. A. Minuth, architect. 97–99 Seventh street, two five-story brick flats; cost, $51,000. Schneider & Herter, architects. 112–114 Second avenue, five-story brick church and Sunday-school; cost, $60,000. S. B. Reed, architect, 128th street, near Lennox avenue, three five-story brick flats; cost, $60,000. Andrew Spence, architect.——Brooklyn, N. Y.: Union street, five-story brick and stone flat. H. Vollweiler, architect. McDonough street, near Sumner avenue, five three-story and basement brick and brown-stone dwellings; cost, $35,000. John L. Young, architect. Greene avenue, near Central avenue, four three-story tenements; cost, $15,000. Henry Loeffler, Jr., architect. Pacific street, near Rockaway avenue, six two-story and basement dwellings; cost, $12,000.——Buffalo, N. Y.: $12,000 worth of interior wood finish will soon be put in the new Municipal Building. C. K. Porter & Son, architects. Plans have been made for a new Italian church, which is to be built on the property owned by Bishop Ryan, at the southwest corner of Court and Morgan streets. The church is to be a plain brick structure, of Roman architecture, and will cost about $12,000.——Lewiston, Me.: A brick school and chapel building will be erected; steam heat; cost, $20,000. Coburn & Sons, architects.——Pottstown, Pa.: A store building will be erected on High street; cost, $19,000. A hotel building will be erected; cost, $12,000. E. Mull, architect.——Reading, Pa.: Center avenue, two Queen Elizabeth cottages; cost, $16,000.——Scranton, Pa.: Penn avenue, a brick store and apartment building; cost, $12,000. F. L. Brown, architect.——Uniontown,

Pa.: A $60,000 Presbyterian church will be erected.——Washington, Pa.: There is considerable talk of erecting a Presbyterian church.——Lancaster, Pa.: Two new school buildings are to be erected.— Pittsburg, Pa: Architect Charles Bickel has completed plans for a new office building on the corner of Wood and Walter streets. The building will be eight stories.——Newark, N. J.: A court-house will be erected; cost, $1,000,000. Address the Mayor.——Trenton, N. J.: The Y. M. C. A. will erect a $60,000 building. Address Architect W. A. Polland.——Hackensack, N. J.: The residents of this place have petitioned the New York, Susquehanna & Western Railroad for a new depot.——Wilmington, Del.: At the last meeting of the directors of the Builders' Exchange the president was authorized to appoint a committee to select a site for a new building, and to report at the next stated meeting of the directors. President Winslow can furnish particulars.——Boston, Mass.: A brick school building will be erected on Green street; cost, $90,000. Address the city architect. 200 Huntington avenue, a brick office building; cost, $60,000. Rotch & Tilden, architects. The Ladies' Aid Association, are to build a new building in connection with the Children's Hospital on Huntington avenue, for the use of the Convalescent Home.——Fitchburg, Mass.: The State Armory Commission have taken land on Church street and in the spring will erect an armory, to cost about $40,000.— Washington, D. C.: Col. Henry Strong has commissioned architect W. Bruce Gray to make plans for a 6-story office building on the northwest corner of Eleventh and F streets.——Plans for the new truck house for the District Fire Department, to go up at Fourteenth and Ohio avenue, have been completed by Architect Brady. It will cost $20,000.——Architect N. R. Grimm has plans for three stores and dwellings, to be built on 7th street northwest. They will cost $20,000.——Mount Auburn, O.: A school building will be erected. Address Jacob E. Conway, chairman of Building Committee.——Akron, O.: The South Akron brick works will erect a $20,000 plant. Address Dr. A. M. Cole, treasurer.——Cleveland, O.: Detroit and State streets a brick and stone hospital; cost, $50,000. Coburn & Barnum, architects. Winsor street, a brick storage warehouse; cost, $10,000. G. F. Hammond, architect.——Defiance, O.: A new school building is to be erected.——Lima, O.: A new depot is to be erected by the Cincinnati, Hamilton and Dayton Railroad Company.——Youngstown, O.: The English Lutheran congregation is talking of erecting a $15,000 church on Euclid avenue.——Columbus, O.: Five dwellings; cost, $11,750.——Dayton, O.: A five-story brick building will be erected on Third street. Main and Third streets, a seven-story brick building.——Kalamazoo, Mich.: A $50,000 library building will be erected. Address H. E. Hoyt.——Marquette, Mich.: The Odd Fellows are about to erect a $20,000 temple.——Grand Rapids, Mich.: The Michigan Trust Company Building Company, with $500,000 capital stock, will erect an office building. The building will cost about $250,000. Clarence F. Waters contemplates the erection of a twelve-tenement building on corner of Barclay and Crescent avenue, to be three-stories and to cost about $10,000. The Grand Rapids Store and Office Furniture Company will build at South Grand Rapids a factory building.——Jackson, Miss.: A $15,000 church building will be erected. Address the Presbyterian Society.——Bristol, Va.: Bristol is to have a new city hall to cost $10,000.——Wytheville, Va.: The Wytheville Development Company decided to erect another $50,000 hotel.——Charlotte, N. C.: 5th and N. Tryon streets, city building; cost, $45,000. G. L. Norman, Atlanta, Ga., architect.——Gainesville, Fla.: Nashua County has voted bonds in the sum of $25,000 for a new court-house.——San Antonio, Texas.: The Southern Pacific will erect a depot here, to cost $55,000. Dwyer avenue, a fine residence; cost, $25,000. Alfred Giles & Guindon, architects.——Sherman, Tex.: The Sherman Seamless Bag Co., will erect a new factory. Lockwood Green & Co. of Boston, Mass., have prepared plans.——Ludlow, Ky.: It is proposed to erect a new school building.— St. Louis, Mo.: Palm street and Blair avenue, a brick factory; cost, $8,000. Wabash tracks and Sarah street, a brick distillery; cost, $80,000.——Denver, Col.: Logan avenue, between 8th and 9th, a brick dwelling; cost, $11,500. H. N. F. Marshall, architect. Penn avenue, between 10th and 11th streets, a stone dwelling; cost, $10,000. I. Hodgson, architect. High avenue, between 31st and 32d streets, a brick dwelling; cost $15,000. Thos. Freeman, architect. Platte street between 8th and 9th streets, a brick store; cost, $15,000. F. C. Eberly, architect. Bert street, between Beecher and Greeley streets, a brick dwelling; cost, $15,000. H. P. Button, architect. Gray street, between Beecher and Greeley streets, three brick dwellings; cost, $15,000. Bert street, between Greeley and Humphrey streets, three brick dwellings; cost, $15,000.——Croakston, Minn.: A Lutheran college has been located here.——St. Paul, Minn.: Selby, near St. Albans street, a three-story building; cost, $12,000.——Milwaukee, Wis.: Milwaukee and Oneida streets, a business block; cost, $15,000. Craine & Berkhausen, architects. Third street, near Wells, a printing office; cost, $37,260. Leipold & Wiskweil, architects. The city proposes to issue $1,525,000 bonds for public buildings and works, including for city hall, $600,000; museum building, $250,000; parks, $200,000, and water works, $100,000.——Columbia, Mo.: A Baptist church will be erected after plans being prepared by S. B. Eisendrath of Chicago.——Racine, Wis.: S. B. Eisendrath, Chicago, will make drawings for a three-story tannery. The same architect is also working on plans for a two-story and basement residence to be erected in this city.

HEATING AND LIGHTING.

Birmingham, Ala.: The Union Electric Company has been incorporated with a capital stock of $50,000.——Chicago, Ill.: The Bain Electric Manufacturing Company has been incorporated; capital stock $250,000; to manufacture and operate electric machinery. Incorporators, Foree Bain, M. F. Allen and B. S. Gray.——Baltimore, Md.: The Schultz Gas Fixture and Art Metal Company will increase the capacity of its factory and put in an electric light plant.——Victoria, B. C.: There is talk of increasing the public lighting system of this city.——Beverly, Mass.: There is a movement at this place toward extending the electric lighting service into the outlaying districts.——Plainfield, N. J.: The Plainfield Gas and Electric Light Company has been incorporated, with E. R. Pope for president.——Davenport, Ia.: It is probable that proposals for lighting the public streets, etc., of this city, will soon be wanted. Mayor Ficke can furnish particulars.——Quincy, Mass.: The Quincy Electric Light Company is about to increase the power of its plant by the addition of a 1,500 light alternating machine.——Cheltenham, Pa.: Efforts are being made to introduce electricity as an illuminating power at this place.——Waco, Tex.: There is a movement at this place looking towards a better lighting system.——Indianapolis, Ind.: The bids to light this city with electricity and gas are all to be rejected and new proposals advertised for. For particulars address Councilman Gauss.——Manistee, Mich.: The Citizens' Electric Light and Power Company has been incorporated with a capital stock of $15,000. —Appleton, Wis.: The common council will issue bonds for $43,000 to pay for an electric light plant for public lighting.——Wallace, Idaho: The Idaho Electric Light and Power Company has been formed, with a capital stock of $500,000, by Charles W. O'Neil, Frank C. Loring and others.——Homestead, Pa.: The Monongahela Light and Power Company has been incorporated. Capital stock, $10,000.——Valdosta, Ga.: The Valdosta Electric Light Company has been organized with M. B. Lane as president; W. E. Thomas, vice-president, and B. W. Bentley, secretary.——Athens, Ga.: J. T. Voss wants boilers and engines for electric power plant.——San Antonio, Tex.: The Southern Ice and Cold Storage Company will purchase an electric light plant.——Lampasas, Tex.: W. A. Patterson, manager of the Elk Opera House, wants bids for furnishing an electric light plant.——Chicago, Ill.: The Albert Galloway Company has been organized for steam and hot water heating and ventilating. Capital stock, $10,000. Incorporators, Albert Galloway, E. T. Brainerd and T. E. Rushbrook.

SEWERAGE NOTES.

La Salle, Ill.: Plans and surveys are to be made for a sewerage system; $1,000 has been allowed to pay for them.——Gardiner, Me.: The city is agitating the question of constructing a sewerage system.— Mount Vernon, N. Y.: At a public meeting of the citizens a resolution was adopted that the charter be so amended by the legislature as to allow them to bond the village for the payment of their sewerage system.——Logansport,

Ind.: Rudolph Hering has completed plans for a sewerage system.——Pittsfield, Mass.: In his address to the city council the Mayor calls attention to the need of a comprehensive sewerage system and urges prompt action on the plans of E. W. Bowditch of Boston.——Cordele, Ga.: The new sewerage system will soon be let by contract; some bids are now in and the officials are ready to receive any more that may be sent in, so they may be acted on by the council. Address J. A. Raiford, Superintendent. ——Syracuse, N. Y.: At a meeting of the Business Men's Association, held January 8, the Committee on Legislation recommended the immediate action of the organization in the matter of certain sewerage extensions, which have, for some time, been projected. As an outcome of the meeting the committee was requested to prepare a bill for the legislature on sewerage and drainage of the city, and to follow it up until it passed.——Beverly, Mass.: The question of doing extensive sewerage work at this place is soon to be put to a vote of the people.——Savannah, Ga.: Mr. W. R. Curtis, civil engineer, has just completed for the Drainage committee estimate of probable cost of new system of sewerage and house drainage, as designed by Rudolph Hering, sanitary engineer, of New York. In this plan the city has been divided into eight sections, and separate estimates have been made for each section and for the outlet sewer.——St. Paul, Minn.: The citizens of Howline, a St. Paul suburb, will petition the legislature for power to issue sewer bonds.——Tacoma, Wash.: The city is to construct new sewers at a cost of $35,000. ——Lyons, Ia.: The question of a new sewerage system is being agitated.——Hornellsville, N. Y.: J. Nelson Tubbs of Rochester has made a survey for a new sewerage system.——Spartanburg, S. C.: It is proposed to issue bonds for a system of sewerage.——Bessemer, Ala.: The city will issue $50,000 in bonds for sewers and street improvements.——East Lake, Ala.: The East Lake Land Co. proposes to put in a system of sewerage.—— Winnetka, Ill.: An ordinance has been introduced providing for the construction of a system of sewerage at a cost of $10,000.—— Newport, R. I.: Mr. Cotton, the street commissioner, recommends an 18 inch main sewer for Gibbs street, at a cost of $10,000, and a main sewer for Coggeshall ave., to cost $30,000.—— Rochester, N. Y.: A main sewer is to be built following the course of Deep Hollow Creek to the river.——Wilmington, N. C.: The question of voting $100,000 in bonds for sewerage will be submitted to the people in April.——Wilmington, Del.: President William M. Canby, William Canby and Dennis J. Menton of the executive committee of the Park Commission, and Major Samuel Canby, the park engineer, are discussing the plans for draining that portion of the city and vicinity on the new road running to the Bancroft tract. The area drained is twenty-nine acres. The portion inside of the city is to be built by the Street and Sewer Department and the remainder by the park commissioners.——Anderson, Ind.: Mr. Henry Rawie, the city engineer, has been authorized to consult Col. George E. Waring, Jr., concerning plans for the sewerage of the city.——Bryn Mawr, Penn.: Col. Waring is preparing plans for for the disposal of the sewerage of the Bryn Mawr hotel.——Old Point Comfort, Va.: Col. George E. Waring, Jr., has been engaged to prepare plans for the sewerage of the whole reservation, including Ft. Monroe. ——Wayne, Penn.: The construction of a system of sewage disposal by surface irrigation on lands lying below the town has been placed in the hands of Col. George E. Waring, Jr.

WATER-WORKS NOTES.

Chicago, Ill.: The city will put into the Hyde Park waterworks two new 24,000,000 gallon pumps, in order that a better supply of water may be had during the World's Fair.——Paris, Ill.: A committee has been appointed to make an estimate as to the probable cost of moving the water-works to Sugar creek, in order to obtain a larger supply.——Oregon, Ill.: The Oregon Water and Electric Power Company has been incorporated; capital stock, $100,000. Incorporators, Charles W. Raymond, W. A. Shepard and L. M. Rose.——Duquoin, Ill.: The city will soon construct a system of water-works, as soft, pure water has been found in abundance by the prospectors.——Sacramento, Cal.: The construction of an entirely new pumping plant, of 10,000,000 gallons capacity, for the Sacramento water supply system has been recommended by A. L. Bell.——Blue Springs, Neb.: Waterworks bonds have been voted for $8,400, which the council have ordered sold. Plans and specifications of the system will be completed and published and mailed to all contractors sending their address to J. H. Casabeer, clerk.——Kendrick, Ia.: The city will construct a water-works system.——Iowa Falls, Iowa: The city is considering a proposition to construct water-works. ——Ogden, Utah: The Bear River Canal Company is advertising for bids to construct the reservoir of the Ogden water-works.—— Huntsville, Ala.: The city will shortly double the capacity of the water-works. Address E. R. Matthews.——Sheffield, Ala.: Efforts are about to be made to enlarge and improve the waterworks system.——Bridgeport, Ala.: The Bridgeport water-works wants prices on a sixty horse-power automatic engine, and cast-iron pipe of six, eight and ten inches diameter.——East Lake, Ala.: A system of water-works and of sewerage will be constructed. The East Lake Land Company can give information. ——Yazoo City, Miss.: A committee has been appointed to investigate as to the cost and advisability of the city erecting its own electric light plant and constructing water-works and sewerage system.——Chester, S. C.: There is a project on foot to establish water-works.——Cordele, Ga.: The water-works plant is to be extended. Address J. A. Raiford.——Staunton, Va.: The city will enlarge the capacity of its pump house by the erection of an addition, in which to place new boilers. Address Newton Argenbright.——Grafton, W. Va.: J. S. Davenport, of Pomeroy, Ohio, is negoitating with the city of Grafton for the erection of a system of water-works for that place. The city council has ordered an election to decide the matter.——St. Louis, Mo.: The citizens of Clifton Heights and Benton, located in the remote districts of this city, are about to present a petition to the municipal assembly asking for an extension of the water-works mains to these places.——New Castle, Ohio: The water-works question is to be decided by a popular vote of the people.——Zanesville, O.: The Water-Works Trustees are considering the question of adding new pumping machinery to the local water-works plant.—— Rushville, Ind.: The Rushville Water Company has been incorporated with a capital stock of $100,000.——Millerton, N. Y.: The city is considering the question of putting in water-works, to supply the village with water.——Sherman, N. Y.: Surveys will be made for a system of water-works.——Rutland, Vt.: William Corliss and Sheldon Boright and the Board of Water Commissioners have been constituted a committee to provide a further supply of water for the village, and authorized to spend a sum not exceeding $2,000 for that purpose.— Berlin, N. H.: A survey for the proposed water-works system is in progress.——New Brunswick, N. J.: At a meeting of the Board of Water Commissioners it was decided to purchase 150 tons of iron pipe for main extensions this year. It is the purpose of the board to replace several miles of the old cement pipe.

BIDS AND CONTRACTS.

West Troy, N. Y.: Sealed proposals, in triplicate, will be received until 12 o'clock on Monday, February 2, 1891, for the delivery and installation complete of an electric lighting plant in the Army Gun Factory at Watervilet Arsenal. Specifications and all other information can be had on application to Lieutenant-Colonel F. H. Parker, Ordnance Department, U. S. Army, Commanding. ——Ft. Payne, Ala.: Bids are wanted until February 19 for a new court-house. Address L. D. Cochran.——Topeka, Kan.: Proposals will be received at the office of the secretary, Topeka, Kansas, until 7:30 o'clock P. M., February 10, 1891, for furnishing materials and constructing a system of water-works on the reunion grounds, Ellsworth, Kansas. Plans and specifications can be seen at the office of the architect, H. M. Hadley, No. 627 Kansas avenue, Topeka, Kan., or may be had upon application to the department commander at Sabetha, or the secretary. Ira F. Collins, Department Commander and Chairman Trustees G. A. R.; A. R. Greene, Secretary.——Wichita, Kan.: Sealed proposals will be received until 2 o'clock P. M., Tuesday. February 3, 1891, for manufacturing and placing in position, in complete working order in the U. S. court-house and post-office, Wichita, Kansas, combination electric light and gas fixtures. Specifications, drawings and blank forms of proposals will be furnished manufacturers and dealers upon application to the Treasury Department, Washington, D. C. Proposals should be addressed to the Secretary of the Treasury, and in-

dorsed "Proposals for Combination Electric Light and Gas Fixtures, Court-House and Post-Office, Wichita, Kan." W. Windom, Secretary.——Washington, D. C.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P.M. on the 5th day of February, 1891, for all the labor and materials required for the erection and completion (except heating and ventilating apparatus and furniture) of the building for draughting-room in south court-room of the U. S. Treasury Department building at Washington, D. C., in accordance with the drawings and specifications, copies of which may be had on application at this office. Jas. H. Windrim, Supervising Architect.——St. Louis, Mo.: Sealed proposals will be received at the office of the Board of Public Improvements until 12 M. on the 27th day of January, 1891, for making the necessary excavations and building four settling-basins complete, in working order, at the Chain of Rocks. Plans may be seen and specifications and forms of contract may be obtained upon application at the office of the Water Commissioner, room 27, City Hall. Geo. Burnet, President.——Boston, Mass.: Sealed bids for building Sections E, F and G of the Metropolitan Sewerage System in Brighton, Newton and Watertown, in accordance with the form of contract and specifications to be furnished by the Board of Metropolitan Sewerage Commissioners, will be received by said board at its office, 93 Lincoln street, Boston, Mass., until 12 o'clock M. of Saturday, February 14, 1891.——San Antonio, Tex.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until the 29th day of January, 1891, for all the labor and materials required, and fixing in place complete the low-pressure, return-circulation, steam-heating and ventilating apparatus required for the United States court-house, post-office, etc., building at San Antonio, Texas, in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at San Antonio, Texas. Jas. H. Windrim, Supervising Architect. ——St. Louis, Mo.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 2d day of February, 1891, for all the labor and materials required to fix in place complete the low-pressure, return-circulation, steam-heating apparatus, high-pressure steam-boiler, etc., boiler-house, coal-vault, etc., for the United States Appraiser's stores-building at St. Louis, Mo., in accordance with drawings and specification, copies of which may be had on application at this office or the office of the superintendent at St. Louis, Mo. Jas. H. Windrim, Supervising Architect.——Slayton, Minn.: The commissioners of Murray county, Minnesota, will receive sealed bids and proposals for the erection of a court-house in the village of Slayton, in said county, until and including February 4, 1891. The plans and specifications may be seen and examined at the office of Frank Thayer, architect, Mankato, Minn., or at the office of the county auditor, at Slayton, Minn. Address all bids and proposals to Charles E. Weld, County Auditor, Slayton, Minn.——Chicago, Ill.: Sealed proposals will be received by the city of Chicago until 11 A. M., Saturday, January 31, 1891, for the construction of a circular brick tunnel seven feet in diameter and about 3,000 feet in length, together with shafts, crib-work, protection, etc., being the extension of the 1,500-foot inlet of the North Side pumping-station, according to plans and specifications on file in the office of the Department of Public Works of said city. Proposals must be made out upon blanks furnished at said office, and be addressed to said department, indorsed "Proposals for North Shore Inlet Extension." W. H. Purdy, Commissioner of Public Works.——Pierre, S. D.: Bids for sewer construction are open until February 2. Address President Coy, City Council.——Statesville, N. C.: The city will receive bids until February 21 for the construction of a system of water-works. D. A. Miller is Mayor. ——Brooklyn, N. Y.: Bids for the construction of an armory for the Twenty-third Regiment will be received until February 10th. Address Josiah Porter, Adjutant-General S. N. Y., 280 Broadway, N. Y.——Cincinnati, O.: Bids for gasoline lighting are open until January 30th. Edwin Henderson, City Clerk.——Denver, Colo.: The Board of Public Works invites sealed bids for the furnishing of all materials, and for all work to be done upon and necessary to complete in place, the sewers and their appurtenances in the Downing avenue sewer, District No. 1 of the city of Denver, as described and as provided in the ordinance of the city of Denver No. 1, of the series of 1891, signed and approved by the mayor of said city the 31st day of December, A. D. 1890, and in accordance with the plans, specifications and directions of said Board of Public Works and the city engineer of said city. Bids will be received until 10 A. M., Tuesday, February 3, A. D. 1891. Each bid must be made upon a blank form provided by the Board of Public Works as approved by the city engineer. Proposals must be indorsed "Proposals for the Construction of the Downing avenue District Sewer No. 1," and addressed to the Board of Public Works, Room 2, City Hall, Denver, Colo. J, E. Bates, President of the Board of Public Works.

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THERE may be a few manufacturers or owners of business blocks who wish there was no ordinance against the smoke nuisance or no one to enforce it, but there is not a person in the city who does not strongly endorse the labors of Chief Inspector Young, and stand ready to support him in his effective fight against this great nuisance. He is rendering a service the city has long needed, and one which should be continued until the city is entirely freed from the smoke that pollutes the air and offends the sense of everyone. Mr. Young has fully demonstrated the fact that he is able successfully to cope with this great evil, and there cannot be the shadow of a doubt that the people will most heartily support him. The Chief Inspector has been fearless, just, and has intelligently prosecuted the important labors of his high office.

THE MICHIGAN STATE BOARD OF HEALTH.

There are differences in governors. A few years ago the Governor of Florida convened the Legislature, in special session, for the sole purpose of creating and equipping a State Board of Health, and his action was highly commended throughout the country. We are now called upon to note the action of another Governor, that of the greater State of Michigan, which points toward the abolishment or serious crippling of the State Board of Health. It appears that it is the desire of the Governor of Michigan to transfer important functions of the Board of Health to the Secretary of State, where their interests will be given into the hands of clerks who have no qualifications whatever for this important work. The collection of vital, meteorological and other statistics, which form the very basis of all sanitary work, and without which preventive medicine would grope in the dark, should be under the immediate direction of experts who, appreciating their value, would make their collection adequate and reliable.

In an interview regarding the intentions of the Governor, Secretary Baker, of the Board of Health, says:

"Yes, as I understand it, he proposes to take the statistical investigations into causes of diseases, the effects of meteorological and other conditions on life and health, the effects of sanitary work, etc., out of the hands of a board of experts, and place these investigations in the hands of clerks who are to be added to the force in the Secretary of State's office. I do not see how the collection of the facts could be made to cost less than by the present method; but might not the results of such statistical investigations by clerks be useless for purposes of creating sanitary science on which to base the important public health-work of a great State? Twenty years' experience in the work with statistics leads me to have very little use for or confidence in vital or sanitary statistics collected and compiled under plans and methods of non-professional clerks. It seems to me that the most important interests—life and health—of the two millions of persons in this great state may well be under the 'supervision' of a board of experts, especially as such supervision is had, by philanthropic sanitarians, without any money outlay by the state for compensation to the members of the board. I fail to see the economy of doing away with the board of unpaid experts, and of putting those highest interests of the people under the care of paid clerks or employes who are to be added to the force in the Secretary of State's office."

While this is all true, there are considerations which are beyond all questions of economy and the diplomacy of the politician. The questions involving the health and lives of two millions of persons are of greater importance than any other that could be brought before the legislators of that state. These very suggestions of the Governor are in themselves absolute proof of the necessity of an efficient Board of Health. They manifest such ignorance of the great practical utility of such a board that its dissolution would become an immediate danger. The public expression of such failure to appreciate the value of the public health-service, in this advanced age, is evidence that services of such a department are a necessity.

If the Governor is laboring under a fit of economy, let him ply his pruning-knife to other branches of the public service, wherein such wide-spread injury could not be done to the people. If he has found such extravagance and waste in his administration that expenses must be reduced, let him look closer about him and retrench in matters that do not touch the health and lives of the public. A saving at the expense of the public health-service would be at a terrible cost, and we trust that the legislators, who stand nearer the people, are better informed regarding the highest interests of their constituents than the executive.

The Michigan State Board of Health is one of the best in this country. It is not only a blessing and credit to Michigan, but is an honor to the nation, co-extensive with which is its reputation. There is not a state in the Union but what points to the Michigan Health Board as a model of excellence and efficiency. The public health-service of Michigan is the best in the country. Its organization is the most complete and its efficiency is greater than any other. The Secretary, Dr. Baker, has a reputation throughout two continents, which he has won in the prosecution of his sanitary labors. There is not a state in the Union which has received as great benefits from the services of one man as Michigan has from Dr. Baker. Should the Governor bring about the retirement of this most excellent health-officer, and the dissolution of the board bearing the impress of his genius, he will make a most

grievous and fatal mistake. The expense of the board as it is now operated is a mere matter not worth the mention. Were it ten times what it is, it still should not be any reason for its discontinuanee.

Boards of Health in every state are the poorest paid departments in the states' service, and their labors are the most valuable; but occasionally some sort of an individual is washed in on the political tide who wishes to distinguish himself, and does not know the difference between notoriety and reputation. These men become notorious for their ignorance regarding the value of sanitary agencies. We had one in Illinois, one in New York and one in Kentucky recently. But there is a consolation in the fact that such men go out with the tide, and down to an obscurity as profound as their ignorance.

BUILDERS' AND TRADERS' EXCHANGE.

Two very important matters received consideration at the recent annual meeting of the Builders' and Traders' Exchange. The lien law, which has never been popular or at all satisfactory because of its many defects and weaknesses, received attention. The law at best is but a fancied security, and entails many inconveniences on the reputable contractor and puts the interloper with no reputation or means on the same standing with the contractor who possesses both of these highly necessary requirements. In view of this the following was adopted:

Whereas, This exchange has declared itself heretofore and is now in favor of "no lien law at all," and fully convinced that the interests of all classes, the builder, the workman and the material man would be better served without lien laws: and

Whereas, The lien law encumbering the statutes of this state is particularly obnoxious and hampers the honest builder at every step;

Whereas, A resolution pledging the efforts of the National Association of Builders "to the total repeal of all lien laws, as far as they relate to buildings," was introduced at its last annual convention, and now lies on the table for consideration of the next convention; now, therefore, be it

Resolved, That the delegates of this exchange be and they are hereby requested to exert their influence in said convention for the adoption of said resolutions.

In addition to this a committee was appointed to go before the Legislature at Springfield and endeavor to get the thirty-fifth section of the law repealed, which will virtually place the law where it was before the recent enactment.

Another important matter considered, in regard to which the meeting put itself on record, was one touching the interests of employers and employes. The last season was not the most happy one concerning the harmony that existed between these two closely related classes. The nature of the relations existing between employers and employes is such that their interests are mutual, and the greatest harmony should exist. Whenever differences arise it is highly desirable that they should be settled amicably and with the least friction possible. Violent or harsh measures from either side have never yet accomplished the end desired. Strikes have resulted in much more harm than good, while peaceable settlements have always been satisfactory. To secure this manner of the adjustment of all differences that may come between employers and employes, the following was unanimously adopted:

Whereas, The Chicago Builders' and Traders' Exchange, in annual meeting assembled, is firmly of the opinion that strikes and lockouts and other labor disturbances may be prevented, and all differences arising between employers and employes in the building trades may be fairly and satisfactorily settled by arbitration, and

Whereas, We are informed that a committee appointed by the National Association of Builders will report to its convention, about to convene in New York, in favor of an agreement to be entered into by the organization of employers and employes of each trade, and provding for the establishment of a joint Committee of Arbitration; now, therefore, be it

Resolved, That the delegates of this exchange be, and they are hereby, requested to exert their influence in said convention for the adoption of such agreement.

Employes will certainly look upon this action with favor and give it a hearty support. When arbitration cannot secure a just settlement there is little left for which to hope from any other source.

SANITARY INSPECTION IN CHICAGO.

We are pleased to see the daily press of Chicago devoting much space to the sanitary condition of the city and the means of securing the same. The following editorial from last Sunday's *Inter-Ocean* is to be highly commended, and we are pleased to note that The Sanitary News is supported by so worthy a source. The editorial in last week's issue of The Sanitary News on the same subject set forth the needs of the city in this regard, and we respectfully call the attention of the city council to this pressing demand, and hope it may receive their intelligent and just consideration:

Chicago has at least 100,000 buildings, ranging all the way from little one-story cottages to "sky-scrapers." It is contemplated by both state law and city ordinance that all these buildings shall be under sanitary supervision. The records of the health office show with elaborate minuteness the plumbing of all buildings as set forth by the plans of the architects, but when it comes to the inspection theory and practice bear only a slight resemblance. This is not the fault of the chief inspector, the efficient and faithful Andrew Young, but is due to the inadequacy of the force. He has ten inspectors for all these 100,000 buildings. It is absurd to expect anything like thorough inspection of 10,000 by one inspector. If he worked night and day he could not do anything so impossible. There ought to be at the very lowest twenty-five. It is a mistake to suppose that any part of the city can be left to itself. The rich man's palace and the poor man's cottage are about equally liable to be saturated with sewer gas. A year ago Mr. Young reported finding whole rows of blocks with sinks which had never been provided with traps, and thousands of costly residences whose waste pipes and soil pipes had never been ventilated. In the same connection the chief inspector pertinently and truly remarks that the law for inspection never contemplated the employment for this service of any other than experts in the business, adding: "I find that it requires special ability and conscientious attention to duty to discover violations and to abate them." Of course it does. Let any one destitute of this special ability, however well up in a general way, undertake the work and he could do no good, except in specially glaring cases of breach of law.

The industrial classes of Chicago are mainly of foreign birth. It is estimated that not more than twenty-five per cent of the working population are native Americans. They are especially liable to be ignorant of the sanitary laws and to become victims of sewer gas. Factory and tenement inspections are for the benefit of the laboring people. But this class has no monopoly of the benefits of inspection. It is expected that all new buildings will be examined before the plumbing is covered up, to see if it is all right, but it is useless for a mere political appointee, with no special qualifications, to make such an investigation. As well expect a blind man to report intelligently on decorations, or a deaf-mute on music.

It is expected that not less than twenty thousand buildings will be erected in Chicago before the World's Fair. Many of these will be cheap affairs, and unless great care is exercised in the inspection a great many of them will be decoys of death and disease. The man who builds a residence for himself or a down-town business block will take special pains with his plumbing, but if he is putting up a lot of cheap structures to rent or sell he is likely to make economy the paramount consideration. It is imperative that the city authorities should use all diligence to reduce to the minimum the danger from all economic violations of the laws of sanitation in building, especially in structures designed more particularly for uses growing out of the fair. There will be large groups of such buildings, and the city must be prepared to exercise more than ordinary watchfulness over their construction. The ultimate success of the fair will largely turn on sanitation.

A cement for leaky boilers (steam or hot water) consists of two parts of powdered litharge, two parts of fine sand, and one part of slaked lime. Mix with boiled linseed oil and apply quickly.

NOTES AND NEWS.

The cold weather in England raised the death rate in London to thirty per thousand.

Good Portland cement, mixed with colors that will combine with it, forms an excellent imitation of marble.

A French scientist declares that the domestic pets of the world carry at least thirty per cent of the common contagious diseases from house to house.

Lysol is the name of a new antiseptic which appears to consist of saponified tarry oils. It mixes readily with water. The preparation is as yet a secret.

The *Bacteriological World* is the title of a new medical monthly, edited by Dr. Paul Paquin, director of the bacteriological laboratory of Missouri State University.

The Georgia Legislature is considering a bill to punish doctors and druggists who become drunk. For first conviction a fine of $200 is proposed, and for the second, the license to practice revoked.

Another bogus medical college has been unearthed in a small Vermont town. It is not incorporated, owns no building, and numbers among its faculty, a telegraph operator, a newspaper reporter, and some doctors of doubtful repute living hundreds of miles away.

The Berlin police have ordered that all buildings taking consumptives to be treated by Koch's "lymph," must be disinfected like those inhabited by diphtheria patients. Further, all patients must be registered at the nearest police station.

Bulgaria is not ranked highest among the civilized nations. But if in its borders a patent medicine is advertised to cure a particular disease, and fails to do so, the vendor thereof is liable for damages and imprisonment, for publishing a lie by which the public is injured in health and purse.

Dr. H. S. Tanner, who fasted forty days, now lives near Clinton, Missouri. He now challenges Signor Succi to sit down with him in Chicago during the World's Fair to test the matter in a ninety days' fast on water only, or, if Succi prefers, let the fast continue from day to day until one or the other yields the contest.

Among other honors conferred upon Dr. Koch, is the Grand Cordon of the Medjidie Order of the Sultan. Countless associations throughout Germany and Austria have given him their highest honors. His assistants have also not been forgotten, for Dr. Pfuhl has been made Professor, and Dr. Libbertz "Sanitary Councillor."

The Seventh International Congress of Hygiene and Dermography is to be held in London during the week beginning August 10, 1891. Every person or corporation, by person or representative, is invited to meet this congress, and take part in its deliberations. The Prince of Wales will preside. Interesting hygienic articles will be exhibited.

Between 1879 and 1888 the number of persons who died of phthisis in Holland is said to have not been less than 247,687, being at the rate of 5.24 per mille of the whole population. During the same period the proportion of deaths from all other diseases of the respiratory organs was only 2.58 per mille.

A new form of chair has been brought out by the Medical Battery Company, of Oxford street, London. An electric current renders the patient insensible to pain when an operation is being performed on him. If this be true the days of laughing-gas, ether, etc., for denistry are numbered.

Two chemists are experimenting at Freeport, Pa., with a view of producing carbon points for electric lighting from natural gas. It is said that by burning the gas in a specially prepared furnace pure carbon is obtained, but as yet at a cost too great for practical purposes.

An ingenious "cut-out" for electric light fittings has been invented. Its novelty consists in securing the lead wire by two eccentric pinches, and in the fact that, should the wire melt from over current, the cover (which has an internal stud resting on the wire) will fly down, thus indicating what has happened.

A contract has been signed for the erection of a building for hygienic instruction, as an annex to the University of Pennsylvania, to cost $50,000. The entire expense will be borne by Henry C. Lea, and it will be the finest structure of the kind in America, and the finest hygienic institution in the world. The building is to occupy a space of 160 by 182 feet. It will have fifty windows to each floor, and the plumbing and other sanitary arrangements are to be perfect.

Among the latest attempted solutions of the cheap fuel problem is the method of a German inventor, who proposes to manufacture gas by dropping a stream of crude petroleum through a blast of cold air from a force pump. The gas thus obtained will be confined in a regular cylinder open at one end, where it will be lighted. This produces an intensely hot flame of several feet in length. By means of this flame the inventor proposes to heat boilers, and he maintains that the heating of large blocks can thus be reduced very considerably.

Of work, Dr. L. C. Lane says: "Through diligent effort in youth, a habit and love of continuous occupation may be firmly planted; and when once so disciplined, the fortunate youth is most unhappy when his accustomed occupation is interrupted; to one so moulded, constant employment brings the sweetest enjoyment. The disciplined son of continuous and regular labor is happy, and he adds to the happiness of those around him; he has reached the highest position attainable in human existence.

In a carefully prepared paper, read before the sanitary convention at Vicksburg, the proceedings of which was published, Dr. Baker gave official statistics and evidence which he summarized as follows: "The record of the great saving of human life and health in Michigan in recent years is one to which, it seems to me, the state and local boards of health in Michigan can justly 'point with pride.' It is a record of the saving of over one hundred lives per year from small pox, four hundred lives per year saved from death by scarlet fever, and nearly six hundred lives per year saved from death by diphtheria—an aggregate of eleven hundred lives per year, or three lives per day saved from these three diseases! This is a record which we ask to have examined, and which we are willing to have compared with that of the man who 'made two blades of grass grow where only one grew before.'"

Why one finds so few good floors when architects never fail to make the proper specifications to obtain such is somewhat of a mystery to every one who suffers from bad floors, and this everyone includes the man or woman who sweeps the floors, those who suffer from the dirt and dust they harbor, and especially those who carry off slivers in the soles of their shoes. Negligence is the principal reason for this state of facts, and both architect and carpenter are open to the charge. As perhaps three-fourths of all floors laid are of yellow pine, a material that gives better satisfaction than even the higher priced hard-woods, and as every architect and every carpenter knows how to obtain an almost perfect floor with this material, where does the negligence manifest itself? In the selection or acceptance of the material. Every board should have a straight, or "comb" grain, and if the log is properly sawed every board will have such a grain, just as quarter sawing produces a grain of peculiar kind and beauty, but very few mills care to take the trouble to saw in this manner, and they will not as long as they can sell any kind of stuff for high grade flooring. Floors to be carpeted are usually made of white pine, and to save a little labor they are usually nailed through instead of being nailed through the tongue. Some of the nails are almost certain to work up and a hole in the carpet is the result. Such things may seem to be small matters, but a multitude of them creep into a building and its occupant can never know the comforts of a well-built house.—*The Northwestern Builder and Decorator.*

PREVENTION OF DIPHTHERIA.

Dr. F. Lœffler has given the following regarding the prevention of diphtheria:

1. The bacillus found in excretions of diseased mucous membranes is the cause of diphtheria.

2. Bacilli are disseminated by excretions deposited on articles within reach of patient.

3. Viable bacilli remain several days after disappearance of membrane.

4. Patient should be strictly isolated as long as bacilli remain

in excretions. Children should remain from school at least four weeks.

5. Bacilli are viable in fragments of dried membrane for four or five months. Every article in the room should, therefore, be either boiled in water or subjected to a current of steam at 212 deg. F.; floors to be scrubbed repeatedly with one to 1,000 bichloride solution; walls and furniture rubbed down with bread.

6. Researches on viability of bacilli in moist state are not yet completed; damp rooms should be thoroughly dried and a flood of light admitted before they are used again.

7. Bacilli will grow at 68 deg. F.; they grow readily in milk. The sale of milk from dairies in which diphtheria abounds should be prohibited.

8. Diphtheroid diseases of various animals are not caused by bacilli of human diphtheria. Diphtheroid diseases of animals are not to be feared as sources of diphtheria in man.

9. Observations of Klein, on ætiological identity of the cat-disease with diphtheria in man, are not proof, and need further corroboration.

10. Lesions of mucous membrane favor the adhesion of diphtheritic virus. Susceptible individuals may, however, be infected without these lesions.

11. During prevalence of diphtheria, the mouths and throats of children must be kept especially clean. Gargles and mouth-washes of aromatic waters and weak bichloride solutions (one to 10,000) should be used as preventives.

12. Meteorological factors favorably influencing development of diphtheria are not known to exist.

MORE ABOUT BACK-VENTING.

Cleveland, O., Jan. 22, 1891.—Editor The Sanitary News: I wish to thank Mr. Geo. E. Waring, Jr., for those compliments of January 17th; for I do consider it complimentary to have a man ranking as high in the profession as he does, admit that my ideas are in accordance with the views of the plumbers and health officers of the country. It shows that my ideas are about right, for I don't think there is any higher authority in this country than the plumbers and health officers. These ideas are based on a foundation that has been and is being built by mechanics who, I know from experience, adopt the best material and method to be used in the construction of such an important foundation. And I will say right here that they are working in the right direction for a perfect completion of such work. They are not experimenting on it, but they are building it. I do not condemn experimenting, but I condemn the productions of a great many experiments.

I do not agree with Mr. Waring that a trap can be syphoned if properly vented. I think that is absurd. It is contrary to natural philosophy. I claim that Mr. Waring never properly vented a trap if he did as he says—taking it from the crown and making it smaller than the waste. If he bases his argument on friction, why does he make his vent-pipes so small, when his experiments show that the smaller the vent the more liability there is of syphonage? But, as I said in my letter to John F. Jerrard, he had to make them smaller to perfect a syphonage. His experiments show that it depends on which has the greater resistance, the trap or the vent. The resistance in the vent-pipe is friction, and in the trap the resistance is the weight of water and the friction. The question is, will it reduce the friction in a pipe to enlarge it, if there is only a certain amount of air to pass through it? I claim it will, and, if I am right, traps properly vented cannot syphon, and the different appliances used to insure a seal are not needed. They are only an obstruction, and serve only to catch filth. Those combination traps are like filters; they allow the water to pass through them, but catch the filth, and in a short time they are entirely stopped. So it is clear that a good water-seal trap with a clear water-way is all that is needed.

I am not writing these letters to advertise some new invention of mine, for I have none. The only thing that I wish to advertise is a good sanitary system of plumbing and sewerage. As far as combination traps are concerned, I think Cleveland is ahead of any city in this country. We have three traps here—the Bower, Cudell and Montgomery—which never were beaten by anything but ventilation. I do not wish to run down any trap in particular, but I don't want to be told before the plumbers of this country that the Sanitas and Puro traps are the best. The space that they have in them to reserve water to make a seal, after the syphonage has taken place, will catch filth, and in six months' use this space will be filled with filth, thereby converting it, in principle, into a common S trap; and then, if not vented, what protection has it against syphonage?

There is a slight danger of the seal being broken by evaporation, but the theory is exaggerated by Messrs. Waring and Putnam, and it can be overcome by a little care on the part of the plumber in properly connecting the vent-pipes, as I explained to Mr. Jerrard, and part of which Mr. Waring in his letter admits.

Now, as far as the system of ventilation gaining the popularity that it has is concerned, I fail to hear any one condemn it, unless it be men who have combination traps which they want to sell; either that or they are like a good many plumbers whom I have heard condemn it. They do not thoroughly understand the system, or they would not take the stand they do. Mr. Waring says that this system would never have attained the popularity it has, had it not opened a field for work and profit for the plumber. His argument on that does not hold good; for in his next remark he says if the system were abolished, it would greatly increase the amount of plumbing to be done. So it is clear that the plumbers did not adopt the system expecting more work and profit by it, but because it was a good sanitary system, and would gain for them a name which we all want—the name of doing a good sanitary job of plumbing. So I would advise Messrs. Waring, Helyer, Philbrook and Putnam to reduce the friction in the vent-pipes by enlarging them, and I will guarantee that they will not syphon.

I would like to hear from other men on this subject—men who have practical as well as experimental knowledge of the system; not shutting off those other men, for, no doubt, they have given the question a good deal of study by experimenting. As far as I can see, however, they have accomplished nothing that is practical, but by further explanations they may show me something that they have accomplished which is practical. Hoping to hear all the objections on this question that can be produced, I am,

Very truly, W. A. Kelly.

GLASS HOUSES AND OTHER POSSIBILITIES.

The future of the glass industry in the United States is encouraging, for it is only since the war that the manufacture of polished plate has grown up; and they are now running, or building, enough furnaces to supply all that will be used in this country. It is within the last ten years that the manufacture of cathedral and rough plate has been thoroughly established, at first disputing and then controlling the home market against England and Belgium. The improvement in window glass has been great, and there are workmen and manufacturers who think they see the rising sun of much better days and a much better American glass. The concentration of capital in powerful concerns must certainly lead to changes in the system of labor that are bound to insure a more finished product. A new glass recently invented in Germany is said to add marvelously to the power of the microscope. A Yale professor announces the invention of a perfect acromatic telescope lans. Legend tells of the lost invention of "malleable glass." Tiberius is said to have discouraged a genius who found the secret by beheading him, fearing that innovation would reduce the value of gold. It is also recorded that Cardinal Richlieu was presented with a bust of malleable glass by a chemist, who purposely let it fall into fragments, and mended it before his eyes with a hammer. The inventor was promptly rewarded by perpetual imprisonment, lest his ingenuity would ruin the "vested interests" of French manufacturers. But if glass may not ape the metals in malleability it may imitate them in another respect just as important. A more fortunate Frenchman (M. de la Bastie) has within a few years introduced into Europe a transparent glass, which, he claims, may displace cast iron. If it fills his expectations it will mark a new era in glass, and the old adage "as brittle as glass," may be superceded by a new one, "as tough as glass." By his process railway sleepers, fence posts, drain pipes, tanks, etc., are cast in moulds and so toughened by a bath in oils as to be stronger than iron, though it is much lighter and costing one-third as much. But it is questioned whether his results reach what is claimed for the process. These undeveloped toughening processes augur the most astounding changes in the coming future of glass. "Glass-houses" may become the fashion and we

would have to reverse our proverb about them, for they would be bomb-proof. Already transparent glass bricks are made. Extending the possibilities of glass a little further, why may we not build the entire structure of glass? The walls might be cemented blocks cast like hewn stone, but it would be translucent, and of any color. One could thus inhabit a huge pile of amber or of gigantic gems. The windows could be multiform, some of them telescopic, bringing distant things near, some with lenses or mirrors guiding the focused sun's heat for culinary purposes, others straining out the light or chemic rays. Tapestries, furniture and utensils might be made of the universal material. The whole would be more enduring than granite. No fire can harm it; Lightning will shun it. Such a dream, blossoming from this miraculous substance, may be realized by an Aladdin whose lamp is of glass.—*Exchange.*

MARTIN MOYLAN MEMORIAL.

At a meeting of the Master Plumbers, on the death of Martin Moylan, the following addresses were made:

GENTLEMEN OF THE MASTER PLUMBERS' ASSOCIATION:

You have been notified to meet this evening for the purpose of taking action and making all necessary arrangements for the burial of our departed brother, friend and fellow craftsman—Martin Moylan.

Martin Moylan died Wednesday evening, December 16, 1890, very unexpectedly. He has passed away from this earth in the flower of manhood, and in the prime of life. It is our duty and our desire to do him honor; to pay to him the last public tribute of respect to his memory by attending his funeral in a body. Martin was a grand and noble-hearted man, foremost in the van-guard of sanitary reform; true and earnest exponent of sound plumbing; a thorough representative of his trade in Chicago. He was known in the councils of the National Association of Master Plumbers as a leader and thinker. His pen was ever ready to defend the law of right; and his voice, which is now silent in death, spoke words of comfort and good cheer. He now rests in peace and his works do follow him in our eternal remembrance.

DAVID WHITEFORD, 1st Vice-President C. M. P. A.

MR. PRESIDENT AND GENTLEMEN: The best evidence of reputation is a man's whole life. In the life of Martin Moylan there have been so many proofs of the character of his nature that it is not to be wondered at the number of friends who mourn his loss. To many he was but a friend in business, but to those who knew him amid the more intimate relation of family sociability, his character presented phrases beautiful in their delicacy and strong in their loyalty and devotedness. He possessed one of those great souls which must be known to be fully appreciated. Yet his virtues shown pre-eminently in all his works. He never acted from any sinister motives, nor was he ever known to perform an unkind deed, but rather labored for the general good of mankind. We have particular evidence of this from the interest he always manifested in this organization. His great ambition was the education of the apprentice and the advancement of the journeymen; that, pursuing a right course of conduct, they might become the benefactors of the human race. He was a good citizen, an admirable man. He revered the land of his birth, but loved the country of his adoption, and no better patriot than he ever lived. His home life presents a picture of happiness. He was never so contented as when surrounded by the wife and little children he loved so well. Love of home was his predominent passion. They will miss this kind devoted care, but will honor and cherish the memory of so exemplary a father. In a word, he was one of God's noblest creatures, and one whose place can never be supplied. J. J. WADE.

MR. PRESIDENT: We bow in humble submission to the decree of God, and with the holy Job cry out, "Thy will be done, O Lord."

There is naught but gloom and sorrow and despair, where before there was naught but joy, hope and cheerfulness. Our former meetings were re-unions where wit and laughter abounded; to-night our meeting place is a house of mourning. I see before me strong men bow their heads in grief, and those who formerly greeted us with cheer, are to-night sorrowfully dumb, their eyes are wet, and their hearts are heavy laden. For he whom we delighted to honor, he who was first to the councils of our Local and National Association, the gifted, the noble, the faithful, honest Martin Moylan, is dead.

Brothers of the Master Plumbers' Association of Chicago, in the death of Mr. Moylan you have suffered a great loss.

Gentlemen of the National Association of Master Plumbers, you have lost a wise counsellor and an able advocate of the cause of sanitary science; an upright, conscientious, brilliant exponent of your cause. Proud city of Chicago, you have lost one of your best citizens, who has done much toward giving your people clean and healthy homes.

Suffering widow, you who have been the dear partner of his joys, the wife of his heart, the mother of his beloved children, what a terrible, what a bitter chalice is thine! For from the day you plighted your love at the altar in the city of New York, God hath blessed the union of hearts, and peace, love, happiness and prosperity dwelt in your home.

But now, alas! in the prime of manhood, blessed with a loving wife, surrounded by lovely and beloved children, in the enjoyment of a happy home, the Lord hath laid His hand upon him. Those lips that were ever true to thee are dumb; those eyes that were wont to look upon thee with love, tenderness and affection are dim; the heart, that loved thee, no longer throbs with joy at meeting his wife and children; its life-blood has congealed; its throbbings have stopped; it is dead.

"For him no more the blazing hearth shall burn,
Or busy housewife ply her evening care,
Nor children run to lisp their sire's return,
Or climb his knees the envied kiss to share."

Martin Moylan was born beside the "lordly" Shannon in "magnificent" Tipperary, Ireland. His father was a prosperous farmer, and gave his son a good education. At an early age he came to New York, where he learned the plumbing trade, after which he moved to Chicago. His long and honorable business career in this city is well known to every member of the trade. It is of his connection with our association that I shall speak.

□ One morning, many years ago, I met a few plumbers in the water-office. I think Mr. Murray, Mr. Roche and Mr. Rock were present. The conversation ran to the condition of the trade, and the poor and cheap work that had been done and the poor materials used. It was agreed by those present that the condition of the business was deplorable, not only in Chicago, but throughout the entire country. And after an exchange of opinions for the betterment of the profession, we concluded to issue a call for a meeting of the Chicago plumbers with a view to the formation of a society that would advance the interests of our trade. The call was issued and the Master Plumbers' Association of Chicago was formed. The great good it has accomplished, the changes it has brought about for the benefit of the householder, is due in a great measure to the wise and masterful leadership of our departed friend; for, from the inception of the movement, his advice and counsel was our guiding-star. We honored him for the good there was in him.

Our representative to the conventions of the National Association at New York, at Baltimore, where the principles that have since been a guiding-light to the plumbers were first promulgated; at St. Louis, at Deer Park, at Chicago and Pittsburg, his great ability, his sterling integrity of character, his eloquent pleading and masterful essays won the admiration of all, and reflected credit on our association.

You have called us together, Mr. President, to make arrangements for his funeral, to pay the last tribute of respect to our associate and friend. Looking around me, and seeing strong men bowed in grief, tells me more plainly than words the anguish you feel. Every man here has lost a dear friend, and I know that your hearts bleed in sympathy for his dear wife and children. I, who have known him so well and so long (almost from childhood), cannot better give vent to my own feelings, in closing this feeble tribute, than to quote the beautiful lines of Fitz Green Halleck:

"Green be the turf above thee,
Friend of my better days;
None knew thee but to love thee.
None named thee but to praise."

MICHAEL RYAN.

MR. CHAIRMAN AND GENTLEMEN OF THE MASTER PLUMBERS' ASSOCIATION: We have met here to-night to do honor to the memory of Martin Moylan, one of our members who died this

week. It is from my heart I join with you to-night to mourn his taking off in the full bloom of manhood. I sincerely sympathize with his good wife and little children, but words will do them little good in this hard, hard world, in the coming days, months and years; only the great God of whom we know so little can assist them, and I have no doubt He will, in His own unknown way, do so. I have known Martin Moylan for ten years, as a friend. He was one of your best members; his counsels were sought for in this association; he was pungent in debate; he was an honorable competitor in the plumbing business; he was a loving husband and a happy father. Martin Moylan was an honest man. He always had the respect of the members of this association. What a blessed taking off our brother had! I understand he was keeping time to the joyous frolics of his innocent children thirty minutes before he died. What a happy thought! No lingering on a bed of pain for months, but, kissing his babes good-night, he fell into the arms of his good wife; gave up to God the spirit that was entrusted to him in this life. May it rest in peace, and the blessing of God follow his wife and children through this their day on earth, and at last may they join in happiness in the other world, is the sincere prayer of one of his comrades. T. C. Boyd.

Martin Moylan.

TO THE MEMORY OF MARTIN MOYLAN.

[by his friend A. W. Murray.]

The voice of love and wisdom, a defender of the right,
That counseled well the erring, and pointed out false pride,
Is hushed at half life's voyage, in the zenith of its life,
A sad loss to our council and his own dear fireside.

The honest hands we firmly held in truest friendship's grasp
Are passed beyond this vale of tears, forever are at rest;
And moistened by our tears, have ceased their labors now,
We lay our memory's chaplet upon his manly brow.

The kindly eye will ne'er again a loving kindred's greet,
Its joyous light or friendly glance, our own will never meet,
For the heart has ceased its beating, and life's warm blood is stayed,
And the smile that lit his features is now in death arrayed.

The bell is softly tolling, his soul is gone before,
Of him whose life and faith were manly, strong and true;
The loved ones of his home will miss him ever more,
As well the brethren of his craft, whose weal he had in view.

Excelsior was his motto, of sturdy aim and thought
His fertile mind and cunning hand, great aid to brethren wrought;
And as a just employer, his memory e'er will live,
To comfort those he leaves behind, whose errors he forgave.

Children of a noble sire, we also grieve with ye,
Unto his stricken widow, we lend our sympathy,
And to his aged mother, in the "Isle across the sea,"
We loved thy son, our brother, and sympathize with thee.

IN MEMORIAM.

At a special meeting held Dec. 19, 1890, called for the purpose of taking action on the death of Martin Moylan, the following resolutions were unanimously adopted:

It is indeed with feelings of sorrow and deep grief that we congregate to do honor to the memory of our departed friend and associate. The sterling qualities of Martin Moylan are so well known that to rehearse them seems almost superfluous; but, pursuant to the time-honored custom, we desire to make a formal record, and testify to our appreciation of his virtues and our affliction at his loss.

He had endeared himself to us by his warm friendship, genial manners, strict uprightness, and ready sympathy for those in trouble.

This association has lost a most valuable member. From its very birth there have been few, if any, who have felt a deeper interest in or labored harder towards its success. He had the courage to follow his convictions, but was quick to acknowledge an error.

To his bereaved wife and children we tender our heartfelt sympathy in their irreparable loss of a kind husband and a loving father, while we mingle our tears with theirs, realizing that by the death of Martin Moylan the Creator has taken from our midst one of nature's noblemen, and we lose in him the most loyal, the truest and best of friends.

Resolved, That a copy of these resolutions be spread upon the records of our association and the secretary be instructed to transmit an engrossed copy to the family of the deceased associate.

Committeee on Resolutions { M. Ryan, E. Baggott, J. H. Roche, J. J. Wade, T. C. Boyd.

REDUCTION OF THE GENERAL DEATH-RATE.

There is a belief that the death-rate is reduced by modern civilization. It is interesting to be able to secure positive observations supporting this belief. It is well known that in England and Wales such observations have been made extending over a term of years. Earr's first life tables were based upon the mortality in 1838 to 1854, in England and Wales. Comparing this with the last life table, and we find that by the old table the mean life-time of males was thirty-nine and ninety-one one-hundredths years, while by the new table it is forty-one and thirty-five one-hundredths years—a gain of about a year and a half upon the length of life of each male. Hence a million males would live 1,439,000, *plus*, more years than during the period of the old table. The expectation of life at birth of females has been augmented by two and seventy-seven one-hundredths years. Two millions of population will thus live more than four million more years than they would during the period covered by the old table; or sixty millions of people would live one hundred and twenty millions more years than they would have done at the beginning of the present century. Further, the gain in these lives is mainly between the ages of 25 and 65—the most valuable portion of life. According to Earr, the minimum value of each life is about $800. It is easy to see that the momentary gain from this reduction of death-rate has been enormous.—*American Lancet.*

VENTILATION OF CHURCHES.

Nowhere have the problems of ventilation been found to be more difficult of solution than in large public buildings. We might say in regard to many, if not most, of these that in this particular matter, bad is the best result that has been attained. It must also be admitted that the state of churches generally proves the rule above stated, but not by way of exception. We may well ask, why is this? Surrounded with spacious windows, furnished with ventilating panes, with several doors, and with a high and arched roof, why is it that their atmosphere during times of worship is so often offensively close? In different cases we should probably find different structural deficiences contributing to this result, with, however, the same consequence in all—defective aeration. One, if not the principal, fault in construction in many of the older buildings is the want of outlets, or of a sufficient number of them. Such openings as do exist are better fitted to act as inlets than as exits. In buildings thus constructed a change for the better would be most fittingly inaugurated by the formation of two or more large roof outlets with revolving cowls. The allotment of floor space is also an important consideration. This, however, is a rule

contrived with a reasonable regard for health considerations. It is only in the event of overcrowding that all individual rights are overwhelmed in the common crush, and wholesome breathing-air becomes more scarce than standing room. The gallery system, also, if adopted on any considerable scale, is open to adverse criticism. By accommodating more sitters it necessarily increases what we may call the breathing surface, while at the same time it lessens the available air-space. If constructed at all, the gallery ought to be of the lightest description compatable with due stability. The correction of the evils we have thus briefly touched upon, and especially the formation of roof outlets to promote the escape of heated and impure air, will go far to obviate such occurrences as that of ladies fainting in church, which under present conditions is only too common.—*Lancet.*

THE SONG OF THE FAUCET.

BY MRS. VAN DYKE.

How dear to my heart are all modern inventions
That help on our household, and prove human skill;
Among them not one can boast greater pretensions
Than those that aid water in mounting up hill.
The ducts, pipes and syphons—the sieves, traps and strainers
That purify reservoir water for drink,
The heating appointments, sink, leaders and drainers,
And even the faucet—that leads to the sink.
The bright burnished faucet, the temperance faucet,
That drizzles and sizzles, and spouts in the sink.

How cute and convenient, one twist of the digits,
And presto! out rushes hot water or cold;
No lugging of boilers till one gets the fidgets—
That broke the poor backs of our grandmothers old.
No more going out upon zero cold mornings
To fight with the bucket, in ice to its brink.
If mosses poetic its sides are adorning,
They're covered with gems, that may sparkle and clink,
But can't buy our faucet, our crooked nose faucet,
That wheezes and sneezes, and spouts in the sink.

No more hov'ring over the contrary kettle
That hung on the old misanthropical crane,
While lords of creation our few wits unsettle,
Impatiently shouting out—breakfast! in vain.
It seems, on arising, that work is progressing,
This wee, witching faucet plays "Brownie," I think.
And secretly aids us. A notable blessing
The housewives protest, and a cute little kink,
Is this spirited faucet, this swift squirting faucet,
That dashes and splashes, and washes the sink.

—*Mrs. Van Dyck in the American Plumber.*

REFORMS IN KITCHENS.

In an article published in the London *Caterer*, regarding the unhealthy conditions under which some European cooks are compelled to serve, is mentioned some interesting information relating to the new regulations adopted by the authorities of Paris, to improve the sanitary condition of kitchens:

The mortality among cooks has recently, and very rightly, been made the subject of searching inquiry at the hands of the Parisian physicians, notably through the exertions of M. M. Hudelo and Napias and Dr. Regeard, the last of whom has come forward as the champion of the *chefs*, in constituting a mutual benefit society under the auspices of the Paris Mutual Council. Dr. Regeard's report embodies many statements and suggestions for reform which we are confident will appear quite as powerful to catering employers on this side of the channel as they have done in France, and we, therefore, consider it to be our bounden duty to lay the facts of the case before the refreshment trades, in the hope that they may tend eventually to the amelioration of the conditions to which workers in the kitchen are subjected, especially in the more densely populated districts of the metropolis and large provincial towns.

It has been discovered that in Paris alone there are no less than about 3,500 persons engaged in culinary pursuits, but, though the proportion of professional cooks to the population is not nearly so great in England, many of the evils of defective sanitation in the kitchen are known to exist in quite as aggravated a form as in the gay capital. In most of our crowded thoroughfares instances are not wanting to prove that basement kitchens, especially in some of our smaller restaurants, are little less than hotbeds of festering filth and dens of disease; and yet the general public is content to swallow food prepared under such unsanitary conditions, and to look upon the matter in the light of a necessary evil, rather than have something that a trifle of agitation may suffice to mitigate and to effectually stamp out. If the Paris cooks have taken the initiative in protesting against the undoubted hardships they are compelled to endure, let us not be behindhand in following their wholesome example. Let our cooks also have the courage to come boldly forward and furnish us with facts, and we shall at all times be pleased to open our pages to the airing of real grievances that have over and over again terminated in disease, desolation and death.

Underground kitchens are not always avoidable, but they need not necessarily be the dens of abomination so commonly to be found in our great cities, overheated, often draughty, and open to contamination from defective drains and an ill-regulated water-supply. It is to be attributed to these causes principally that cooks are so subject to specific diseases from which other domestic workers are to a considerable degree exempt. Cook's anæmia, inflammation of the stomach and eyes, varicose veins, and skin disorders, are quite common among comparatively young persons, and this has been accounted for by the fact that the youth who aspires to culinary honors is usually obliged to undergo an apprenticeship of several years in the unhealthy surroundings above mentioned. Many of our friends will, doubtless, be able to corroborate these statements, but it may nevertheless be as well to look a little more closely into the facts of the cases under consideration as they at present obtain in Paris. It appears that very many of the restaurant kitchens that have come under the observation of Dr. Regeard are positively dark, and are only illuminated artificially by gas, or from windows on a level with the ceiling. These, the only ventilators of the apartment, are seldom opened, because of the objection of neighbors to kitchen smells, and the cooks very naturally object to having them opened on account of the resulting draught. Then, again, the larders are often in proximity to the closets—an arrangement which stands self-condemned.

To abolish those evils and to lessen disease and mortality among cooks has been the endeavor of the Paris Municipal Council, who have drawn up a set of rules which caterers in this country would do well to study with attention. First of all, it has been stipulated that the size of the smallest kitchen shall not measure less than 10 by 8 feet, and shall be fully 9 feet 4 inches high. Then, again, a free passage of five feet must be left always clear in front of the fire, and to better effect this the tables are to be fixtures, so that they cannot be moved, and thus encumber the necessary free space of the kitchen.

All kitchens must have openings, measuring at least twenty superficial feet, and giving access to either the street or a yard. In every instance the windows must admit sufficient daylight during ordinary weather to enable the cooks to do their duties in perfect comfort; and gas-jets, if used, shall be 6 feet 8 inches above the floor. To keep the kitchen free from sewage contamination, all waste-water must be discharged into the drain or street-gutter, and a syphon must be placed in the pipe used for such purpose. The kitchen will not be permitted to occupy a basement or celler unless its floor is above the level of the public sewer, so that it may be efficiently drained. Another very useful rule is that the larder shall be disconnected from the kitchen, and shall only ventilate on the street or a yard; this precaution is for the purpose of preventing the hot air from the kitchen entering the larder. All connnections with the sewers must be extramural; closets, portable pails, uriuals, etc., to be carefully ventilated, well lighted, properly trapped, and quite apart from the kitchen.

We observe that the relative advantages of the kitchen at the top of the house and below stairs are not discussed or even incidentally referred to, and yet the question is a pregnant one for cooks as well as their employers. Such rules as those recited may with advantage be considered by *restaurateures* on this side of the channel, but, taken *en bloc*, the kitchens of London compare fa-

vorably with those of the French capital. But there is, undoubtedly, great room for improvement in English hotel and restaurant kitchens, which in too many instances are not calculated to inspire customers with confidence. Indeed, a peep into some would prove an effective antidote to the most ravenous appetite.

FOUL PIPES.

Cast-iron foul-air pipes located on the outside of buildings, says the *Building Register*, are, under some circumstances, among the most potent and insidious means of introducing drain-gases into sleeping and other apartments.

For obvious reasons, it is necessary that the air in ventilating pipes must be warmer than the outside air, to establish and maintain an up-draft therein. If the pipe is exposed, it is impossible to obtain such a draft to a serviceable extent in cold weather. The pipe fills with gas, which is retained under pressure by the cold air above, and for want of a draft escapes by any lateral vent conveniently offered.

The vicissitudes of the weather frequently develop flaws in the iron into apertures, and cause the pipes to crack. When such openings occur near a window or fresh-air inlet, quantities of the drain emanations in the pipe escape and are wafted into windows or drawn into those inlets, and thus incorporated in the air of inhabited rooms.

In a recent case, in which the presence of drain-gas was offensively perceptible, the inspector failed to find any defect in the indoor plumbing, and almost despaired of finding a solution of the difficulty, until he discovered a crack in the outside ventilating-pipe, almost in front of the opening of the fresh-air inlet. Thus is manifested another instance of the extent to which the health and lives of the inhabitants of modern dwellings depend upon the intelligence and conscientiousness of the plumber.

ST. LOUIS MASTER PLUMBERS.

John McMahon, Chairman of the Entertainment Committee at the St. Louis Master Plumbers' Reception on January 20th, has written us as follows concerning the festivities on this occasion:

About one hundred and fifty guests were present, among whom were Mayor E. A. Noonan, the city officials and representatives of all the supply houses, the daily and trade press.

While disposing of several quarts of Cook's Imperial, the members and friends were entertained with toasts, songs and recitations. President J. P. Gallagher discoursed on the "Local Association and what it has accomplished." Mayor Noonan waxed eloquently on the "Greatness of St. Louis." N. O. Nelson spoke on "Our Supply Houses." The Trade Press was represented by Ben Deering while Thos. J. Hennessy expounded The New Sanitary Laws.

The music was furnished by the Marquette Quartette and several well known stars of St. Louis.

The entertainment was one of the best ever given by the St. Louis Master Plumbers' Association, and about 1 o'clock the invited guests departed to their homes feeling under many obligations to the members of the association for the very pleasant evening spent in their hall.

The officers of the association for the ensuing year are Jos. P. Gallagher, President; M. P. Ward, First Vice-President; William Kuhn, Second Vice-President; William Morris, Treasurer; J. A. Wilke, Financial Secretary; J. M. Life, Corresponding Secretary; M. Taffe, Sergeant-at-Arms; J. Arnold, R. E. Hopper and James Carroll, Auditing Committee.

COLUMBUS MASTER PLUMBERS.

S. A. Esswein, Secretary of the Master Plumbers' Association, at Columbus, Ohio, writes us that his association was highly pleased with the recent visit of the officers of the National Association of Master Plumbers.

The visit of the officers acted as a stimulant to the association which increased its membership considerable during their short stay. The visiting members also contributed their information on the subject of securing a plumbing inspector and sanitary regulations for large cities.

The *Ohio State Journal* speaks as follows concerning the reception given the visitors on Saturday evening, January 24th:

The Master Plumbers' Association of Columbus gave a reception last evening in honor of President Robert Griffith and officers of the National Master Plumbers' Association. President Griffith was accompanied by Hon. M. J. Lyons of Brooklyn, Treasurer; Hon. J. A. McDonald, New York, Vice-President, and Mr. Reed of Rochester, member of Executive Board. The Columbus Master Plumbers were invited to meet them at the Thurman club.

Mr. D. N. Kelly, President of the local association, said the visit of the gentlemen should prove profitable to the association and the beginning of a united effort to elevate the craft to the place that scientific sanitary plumbing belongs. President Griffith spoke at length upon sanitary plumbing. He said the Chicago Board of Health had been composed of broken down politicians who were incapable of inspecting plumbing. The plumbers had agitated the subject until now they have practical plumbers on the Board of Health and 14 practical plumbers employed as inspectors. He had noticed the beautiful streets of Columbus, which would be a credit to any city, but underneath these beautiful streets there are miles and miles of iron pipes for water service which will rust and decay in a short time and the streets will have to be torn up again to replace them. Lead pipes should be used instead of iron. He referred to the service pipes from the mains to the curb. He was informed these pipes were put in by the city, and he was glad the plumbers were not responsible for that work.

Vice-President McDonald made a speech on the best means of educating the masses to appreciate scientific plumbing. He gave an interesting account of the Trade school in New York. Treasurer Lyons urged the association to continue its work for material interests and more effective organization. He gave an account of the progress of work in Brooklyn. Mr. Reed made an interesting speech on work in Rochester.

The meeting adjourned for an elegant banquet at the Ambos restaurant, where experiences were exchanged in responses until a late hour.

KANSAS MASTER PLUMBERS' ASSOCIATION.

C. J. Prescott, Secretary of the Association writes us on January 24th that the Kansas Master Plumbers' Association will hold a quarterly meeting in Kansas City, Kansas, on February 9th, 1891. The association will be glad to receive and act upon communications relative to the welfare of the craft in general or of other brother associations. Such communications should be forwarded before February 9th to Mr. Prescott at Topeka, or to Jas. Foley, President of the Associatien, whose address is at Leavenworth.

EDIBLE BIRDS' NESTS.

These, according to Marshall (*Apoth. Zeitung*), are constructed, not by genuine swallows, but by species allied to the European martlet, and known as "salanganen." They differ entirely from the nests of other birds, bearing more resemblance to silkworms' cocoons, since their material, like silk, is simply a salivary secretion which has hardened in the atmosphere. In both sexes of the "salanganen," the salivary glands become swollen during the breeding season, and the birds first shape their mucus into a semicircular ledge which is then glued to the smooth surface of the rocks, and serves as the foundation for their nests. This product is closely related to mucin, which is the chief constituent of animal mucus, and makes up the entire tissue of the snail. Placed in water it swells up, but does not dissolve. The nests are prepared for eating in various ways. The Javanese boil them into a slimy mass, which, after a night's exposure to the open air is mixed with sugar and taken as a refrigerant, especially in acute fevers, also in cases of sore throat and hoarseness. The Chinese, who are their chief consumers, boil them along with fowls for twenty-four hours, and regard them as a powerful aphrodisiac. It is computed that $1,500,000 worth of edible nests are annually gathered throughout the Indian Archipelago. These, however, are not the only kind used medicinally. In Southern Russia the wooly nests of the field titmouse are burnt by the peasants, and the pungent fumes thus produced are inhaled as a remedy for all diseases and infirmities, whether of man or beast, but more particularly for intermittent fever. In Kasan this singular panacea is sold by the wagon-load.

AMONG THE PLUMBERS.

James Madden, of Ft. Wayne, Ind., wishes us to correct the statement in the last issue of THE SANITARY NEWS which represented him as a member of the firm of Madden & Cox. Mr. Madden desires it to be distinctly understood that he is doing business under the name of only James Madden. Very well, Mr. Madden; we will gladly correct the mistake, and will willingly help you, when you come to the city again, to whip your Chicago friends who mislead us by stating that you are still a member of the old firm.

Dr. George A. Hall, a Prairie avenue physician, has been made defendant in the Superior and Circuit Courts of Cook county, in two suits for $15,000 and $5,000 each, brought by Mrs. Dora Findlay, for the death of her son. Mrs. Findlay rented a house from Dr. Hall on Indiana avenue, and claims that by reason of sewer-gases her son died. The $15,000 suit is brought by Mrs. Findlay for the loss of the son's services, and the $5,000 case by her as administratrix of the estate for his death. She kept boarders, and in addition to her son's demise all her boarders, she says, left, and she lost everything.

We are indebted to the Barry Manufacturing Company, of Muscatine, Iowa, for a beautiful souvenir of that prosperous city.

E. D. O'Brien, of Buffalo, N. Y., writes: "Through the advertisement inserted in an issue of your paper, I have secured a position, and feel very thankful for the same. I go February 1 with the L. M. Rumsey Manufacturing Company, of St. Louis, to represent them in the South." We congratulate Mr. O'Brien on his good fortune in forming a connection with such a good, progressive and reliable firm as the L. M. Rumsey Manufacturing Company, and trust the relations formed will prove mutually pleasant and profitable.

The citizens of Chicago are in sympathy with the Health Department in the movement to increase the number of inspectors, and to secure the appointment to this position of plumbers instead of bummers.

The Schrimpf & Keim Boiler Manufacturing Co., Morristown Pa., sustained a loss by fire on January 11th, nearly all of which was covered by insurance.

The Chicago master plumbers are printing a handsome memorial pamphlet for the friends and admirers of Martin Moylan, which will contain a copy of the beautifully engraved resolutions passed by the association, and the addresses delivered at the special meeting held on Thursday evening after his death. A copy of this memorial, together with a picture of the deceased, will be presented in this issue to the patrons of THE SANITARY NEWS.

The plumbers of Pittsburg will fit up the following buildings: H. T. Hunt & Co., two houses in the Twentieth Ward, and one on Edwin street; A. G. Ehlers, a house on the corner of Baum and Beatty streets; Houston & McShane, a house on Negley avenue; James J. Ricketts, a house on Oakland avenue; Reinecke & Co., a house on Ellsworth avenue, and one on Smithfield street; W. N. Sauer, a house in the Twenty-second Ward.

We learn with pleasure from Mr. David Bain that the Southern climate is gradually restoring his brother's health.

The Sanitary Code of New York defines a tenement "to be and include every house-building or portion thereof which is rented, leased, let or hired out to be occupied as the residence of three or more families living independently of one another and doing their cooking on the premises, and having common right to the halls and water-closets." It requires one water-closet for every two families in a tenement-building, and one for every fifteen persons in such building.

Mr. Rosenberg, a tinsmith in South Chicago, was arrested on January 22d for doing plumbing work without a license, and contrary to the rules and regulations of the Health Department. The case came up before Justice Wallace on the 24th, and a continuance was granted until the 28th, in order to give the defense an opportunity to introduce some expert testimony. After hearing the evidence carefully, the judge rendered a fine of $110 and costs.

The city government of Birmingham, Ala., is discussing the adoption of strict plumbing regulations, and Col. Geo. E. Waring, Jr., has been instructed to prepare and submit a code of rules, with recommendations.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago: Paulina street, three-story flat building. Thomas & Geyer, architects. Union street, near Randolph, five-story building. J. C. Loubell, architect. Arthur G. Morey has made plans for two three-story residences. Honore street, two-story dwelling and a two-story flat will be erected. George Grussing, architect. California avenue, three-story store and flat building and eight dwellings will be erected. G. Bloedner & Co., architects. Fulton street, two-story flat building. Faber & Pagets, architects. Furst & Rudolph have plans for the remodeling of the building on the corner of Franklin and Adams street, for a four-story store and apartment building and a natatorium to be erected on Wabash avenue near Twenty-third street. Thomas & Rapp are to prepare plans for a high school building at Oak Park to cost $40,000. They have also drawn plans for a three-story residence to be erected on Drexel boulevard near Forty-third street, to cost $25,000, and a one-story addition to and the remodeling of the building at the corner of Fifth avenue and Monroe street, to cost $20,000. Corner of LaSalle avenue and Goethe street, an eight-story apartment house will be erected; cost, $250,000. North Clark street, $300,000 will be expended in improvements on the Palace Hotel.—New York City: Southwest corner of the Boulevard and 71st street, seven-story brick and stone hotel; cost, $200,000. Ralph S. Townsend, architect. Twenty-seventh street near Ninth avenue, three five-story brick and stone flats; cost, $90,000. Richard R. Davis, architect. Leroy street, near Bedford street, two five-story flats; cost, $42,000. 68th street, near Columbus avenue, three five-story flats. A. B. Ogden, & Son, architects. 364 and 366 Third street, five-story brick factory; cost, $16,000. J. Boekell & Son, architects. 123rd street, two six-story tenements; cost, $28,000. Edward Wenz, architect. 85th street, near Columbia avenue, five-story brick flat; cost, $25,000. G. A. Schellinger, architect. 84th street, two five-story brick flats; cost, $53,000. G. A. Schellinger, architect. Market street, near Water street, six-story brick store and tenement; cost, $45,000. Harding & Gooch, architects. 314 Madison street, five-story tenement; cost, $23,000. F. Wandelt, architect. 64 Baxter street, five-story brick store and tenement; cost, $20,000. F. E. Eberling, architect. 123rd street, near Lexington avenue, five-story store and flat; cost, $50,000. Andrew Spence, architect. 90th street, near Central Park, three three-story dwellings; cost, $36,000. G. F. Pelham, architect. 363 Canal street, six-story brick workshop and store; cost, $14,000. Leicht & Harell, architects. West End avenue, between 76th and 77th streets, fourteen four-story brick and stone dwellings; cost, $350,000. Lamb & Rich, architects. Eagle avenue, near West avenue, seven-story brick hotel; cost, $165,000. W. Kusche, architect. Mulberry street, near Bayard street, five-story brick school; cost, $175,000. George W. Deberoise, architect. Great Jones street, six-story brick workshop and stable; cost, $30,000. C. W. Clinton, architect. Duane street, six-story brick store and warehouse; cost, $95,000. S. A. Warner, architect. 410-414 Sixteenth streets, a store and warehouse improvements; cost, $60,000. D'Oench, & Simon, architects.—Brooklyn, N. Y.: Meeker avenue and Sutton street, two four-story frame stores and tenements; cost, $15,000. Frederick Weber, architect. Suydam street, nine three-story frame tenements; cost, $58,500. Frank Holmberg, architect. Seventh avenue and nineteenth street, five three-story frame tenements; cost, $28,000. W. N. Calder, architect. Powell street, six two-story dwellings; cost, $12,000. A. J. Warren, architect. Knickerbocker avenue and Himrod street, four three-story frame tenements; cost, $18,200. F. J. Lessing, architect. Lawrence street, four-story brick furniture warehouse; cost, $15,000. Charles Werner, architect. Waterbury street, two-story brick factory, store and engine house; cost, $19,000. Clifton A. Hall, architect. Dean street, near Buffalo avenue, fifteen two-story and basement dwellings; cost, $35,000. Frank P. Martin, owner. Osborne street, three three-story tenements; cost, $16,500. Chas. Infanger, architect. Nassau avenue and Newel street, four three-story brick stores and dwellings; cost, $20,000. C. E. Stockford, architect. Macon street, six two-story and basement dwellings; cost, $27,000. Cornell & Barnes, architects.—Philadelphia,

Pa.: Newkirk street, between Jefferson and Master streets, sixty-four dwelling houses will be built by W. L. B. Roberts. Three large houses will be built in the First Ward by A. A. Harmer. Forty-fourth street, seven residences will be built. Thomas Marshall, owner. Wayne avenue and Denny street, sixteen dwellings will be built. James Mole, owner. Germantown and Roberts avenue, a number of houses will be built by Loyd Bailey. 1520 Chestnut street, the new century club will soon erect a new club house. Edgely street, east of Tenth, twenty-two houses will be built by John M. Shay. He will also build ten on French street and nine on Tenth street. Tenth and Carpenter streets, a large building will be erected by the Hebrew Educational Society. Indiana avenue and Fillmore streets, a factory; cost, $90,000.——Waynesboro, Pa.: A block of stores will be erected. E. F. Bertolette, architect.——Clifton Heights, Pa.: Max Rosenfelt will build a public hall.——Cape May, N. J.: A cottage will be erected for William Essig. L. D. Button, Philadelphia, architect.——Atlantic City, N. J.: The Irving Hotel will be enlarged and improved after plans prepared by Architect Addison Hutton, Philadelphia.——Washington, D. C.: Furness, Evans & Co., Philadelphia, will make the drawings for the house to be built at Washington by Secretary Blaine.——Atlanta, Ga.: Professor Emme and others of Atlanta, have organized the Emme Aluminum Development Company, with a capital stock of $40,000, and will erect an aluminum factory.——Providence, R. I.: The city council has directed the city solicitor to apply to the General Assembly for authority to issue bonds for to erect school buildings.——Cambridge, Mass.: The Cambridge Aldermen have voted to increase the city debt $100,000, to meet the expense incurred in building the new English high school house.——St. Louis, Mo.: Bell avenue, between Cardinal and Compton avenues, two-story brick flats; cost, $14,000. A. Meglitsch, owner. Broadway, between Brennan avenue and Angelica street, two-story brick boiler house; cost, $14,000. Jefferson avenue and Adams street, two-story brick store and dwelling; cost, $17,000. M. Albus, owner.——Denver, Col.: Architects Merideth & Mau have prepared plans for a printers' home to be erected at Colorado Springs, Col., for the National Typographical Association. To be five-stories high; cost, $50,000. Architects Balcomb & Rice have plans for a hotel to be erected corner Sixteenth and Cleveland place for Milo A. Smith. To be three stories high; cost, $35,000. S. L. Holzman will erect on the southeast corner of Seventeenth and Curtis streets an eleven-story office building to cost about $300,000; Mr. Holzman has also decided to erect a fire-proof five-story building adjoining the Bancroft block, of which he is the present owner, at Sixteenth and Stout streets. The estimated cost is $80,000.——Grand Junction, Col.: Architect Charles H. Burggraf has prepared plans for a theatre, store and office building to be erected for Smith and Baldwin. To be two and a half stories, built of brick with stone trimmings; cost, $13,000.——Grand Rapids, Mich.: The theological seminary of the Holland Christian Reformed church on Williams street, will erect a college building suitable for the needs of the seminary, to cost about $15,000. The people of Grand Rapids will soon be called upon to vote upon the proposition to bond the city for $200,000, for the purpose of building a public market over the river.——Fennville, Mich.: The following persons, burned out last fall, will probably build business property: John Dickinson, Walt. Hutchins, Wm. McCormick, James McCormick, D. R. Crane, Adelle Purdy, Mr. Bail, N. L. Chamberlain, John Whitbeck.——Roanoke, Va.: The Bridgewater Carriage Co. will build a factory and another building; cost, $12,000.——Atlanta, Ga.: Architects McElfatrick & Sons, New York, have prepared plans for an opera house to be erected at Atlanta for L. de Give; cost, $80,000.——Galveston, Tex.: Architects N. J. Clayton & Co. have prepared plans for a bank building for Adone & Lobit; cost, $30,000. Architects N. J. Clayton & Co. have prepared plans for the Sacred Heart Cathedral, which is to be built at Dallas, Tex.; cost, $100,000. Architects N. J. Clayton & Co. have prepared plans for a public school which will be erected at Columbus and cost $12,000.——Minneapolis, Minn.: Lambert Hays, 22 Washington avenue, north, new roof and inside repairs on Bijou theatre; $35,000. T. H. Edmunds, three two-story frame dwellings, at 162, 166 and 168 Linden avenue; cost, $19,500.——San Francisco, Cal.: A large building, to contain thirty-six flats, is to be built on the northeast corner of Sacramento and Mason streets by E. A. Denicke. The new seven-story insurance building to be erected on the northeast corner of Sacramento and Montgomery streets is now in the market. Wright & Sanders will let the contracts on February 1st.——Meriden, Conn.: The Universalist Society will erect an edifice; cost, $50,000; architect, B. Hammett Seabury, of Springfield, Mass.——Baltimore, Md.: Architect William Bruce Gray, of Washington, is about to prepare plans for a new theatre to be erected on the site at present occupied by the Natatorium adjoining the Academy of Music.

HEATING AND LIGHTING.

Brooklyn, N. Y.: Bids are solicited for the heating apparatus to be placed in the Twenty-Third Regiment building. Address Major-Gen. Josiah Porter, 280, Broadway, New York.——St. Paul, Minn.: A company is to be organized by St. Paul and Minneapolis business men to make gas, by a newly patented process, from crude oil.——Gibson, Ill.: A company will be organized to light the town by electricity.——Marlboro, Mass.: The Germania Electric Light Company has been incorporated.——Toronto, Ont.: The Niagara Falls Electric Light Company has been incorporated.——Chicago, Ill.: The United States Gas Consumers Protective Association has been formed at Chicago to inspect gas and water meters; capital stock $15,000; incorporators, James B. Quinn, Joseph H. Harrison and John W. Harrison.——Aurora, Ill.: The Aurora Gas Company, has completed the purchase of the plant and business of the Aurora Electric Light and Power Company, and has now a monopoly of the field.——Chicago, Ill.: The Chicago Incandescent Light Company has been formed to manufacture and deal in electrical supplies; capital stock, $15,000; incorporators, Clarence S. Olmsted, Edwin S. Osgood, and Harvey R. Husted.——Houston, Tex.: The Houston Electric Light Company has been incorporated with a capital stock of $25,000.——Birmingham, Ala.: G. W. Beggs, J. E. Lee and H. T. Beggs have incorporated the People's Electric Light and Gas Company for electric and gas lighting purposes. The capital stock is $100,000.——Greenwood, Miss.: The Planters Oil Mill and Manufacturing Company desires to correspond with constructors of electric light plants.——Madisonville, Ky.: An electric light plant is to be erected. The Mayor can give information.——Maysville, Ky.: The Maysville Gas Light Company will add an electric light plant to its gas-works.——Henderson, Ky.: A stock company has been organized with W. H. S. Burgwyn, president; J. R. Young, vice-president, and J. P. Taylor, secretary. It has purchased the electric light plant of the Henderson Electric and Gas Light Company, and will improve and operate same.——Washington, D. C.: The Metropolitan Railroad Company contemplates the erection of an electric power plant.——Middlesborough, Ky.: The Middlesborough Electric Light, Heat and Power Company, will put an incandescent dynamo and other additional machinery in its electric light plant.

SEWERAGE NOTES.

Wilmington, N. C.: The city will petition the present legislature for authority to issue $100,000 of bonds for sewer purposes. Mayor Fowler can give particulars.——Hornellsville, N. Y.: $100,000 will be expended next year for sewers.——Newton, Mass.: $400,000 in bonds will be issued for sewerage purposes.——Aurora, Ill.: The city has appropriated about $200,000 for the construction of a sewerage system.——Brooklyn, N. Y.: A bill has been introduced for the appropriation of an additional sum of $500,000 for sewers in ward 26.——Newark, N. J.: The Commission appointed to assess benefits for the intercepting sewers have submitted a majority and a minority report to Judge Depue in the Circuit Court. The former recommends that the whole cost of the construction should be assessed upon the city at large, while the latter recommends that it should be assessed partly upon the owners of property benefited.——West Knoxville, Tenn.: It is proposed to issue bonds for $75,000 for sewer purposes.——Desplaines, Ill.: The village Board of Trustees has been discussing plans for drainage and sewerage.——Montreal, Can.: Sewers are to be constructed on Balmoral, Nellie and Colony streets.——Avondale, O.: Plans and specifications are on file for lateral sewers and drains. A. S. Hobby, 227 Main street, Cincinnati, is

the engineer for the Board of Sewer Commissioners.—— Providence, R. I.: $2,000,000 will be expended on the city's sewerage system.

WATER-WORKS NOTES.

Chicago, Ill.: S. W. Seay, Room 9, 69 Dearborn street, wants a pump.——Morris, Ill.: The city has voted to grant a franchise for water-works.——Hinsdale, Ill.: Plans and specifications for water-works have been prepared by George C. Morgan, Chicago. ——Colorado Springs, Colo.: E. W. Frost, superintendent, reports that $80,000 will be spent for new pipe, hydrants, a reservoir and additional water rights.——Kearney, Neb.: H. D. Watson and H. H. Martin, members of the Miller Land Company, will construct a complete water-works system here.——Seattle, Wash.: Superintendent Chalk, of the Seattle water-works, has reported that he concurs with Benezette Williams as to the necessity of pumps of greater capacity for the water system. Another set of pumps is recommended and improvements suggested, the cost of which will be $237,650.——Oxford, N. C.: J. W. Nelson, representing Woltman, Keich & Co., of New York, has submitted plans and specifications for a system of water-works.——Newberry, S. C.: The city will hold a public meeting to consider the advisability of constructing a water-works system. The mayor can give further information.——East Rome, Ga.: The city has voted a tax of one-fourth of one per cent. to build water-works.——Leesburg, Fla.: The construction of a system of water-works is projected.——Attalla, Ala.: Preparations to issue city bonds for works are being made, and bids will be wanted about March 1st; estimated cost, $25,000. The proposed supply is from a spring, and the plan includes a reservoir. Address L. B. Whatly,—— Bridgeport, Ala.: The city will lay about six miles of pipe, and will need about 16,090 feet of six-inch, 10,000 feet of eight-inch, and about 5,000 feet of four-inch cast iron pipe. It will also erect a stand-pipe to hold at least 6,000,000 gallons. Specifications and estimates on the above are solicited by Wm. H. Brundige.——Terrell, Tex.: Some capitalists are talking of purchasing the water-works from the city, and so arrange them as to put all the city under fire protection and every dwelling in reach of a water-main.——Bastrop, Tex.: The Improvement and Investment Company will devote its entire paid-up stock to the construction of a system of water-works, sufficient in extent to satisfy the present and future needs of the town.—— Frankfort, Mich.: The Frankfort City Water Company has been incorporated.—— Quincy, Mass.: The late city council, before adjourning *sine die*, accepted the report of Engineer Blake, of Hyde Park, concerning the proposed water-works system, and passed an order requesting the mayor to petition the Legislature for authority to establish it.——Lynn, Mass.: The water board, in its annual report, calls attention to the importance of laying a new and larger additional main along the northern side of the city at the earliest possible moment.——Waterbury, Conn.: The mayor, in his annual address, urges that something be done toward obtaining a new supply of water. He refers to several sites, but enlarges on the very great advantages offered by the Quassopaug. He thinks that the lake is the proper place to go for a water-supply, and that by prompt work the city can be connected with it by January 1, 1892. ——Kearney, N. J.: A petition bearing the signature of 113 persons, and asking for the erection of a stand-pipe or tower in Arlington, has been presented to the township committee, and referred by them to the fire committee.——Townshend, Vt.: Citizens have the question of water-supply under consideration.—— Providence, R. I.: The city has asked the General Assembly for $500,000 with which to extend the water-works.——Cambridge, Mass.: The city fathers have voted to increase the city debt $20,000 for water-works improvements.——Essex, Ont.: The construction of water-works is being considered. Mayor John Milne can give information.——Holland, N. Y.: The Holland Water-Works Company has been incorporated, with a capital of $10,000.—— Schenectady, N. Y.: The water commissioners have made a preliminary report to the council upon the subject of obtaining a new and pure water-supply, It is believed that a satisfactory supply can be obtained from wells sunk on Van Slyck Island, in the Mohawk, above the city. It is recommended that authority be obtained to issue bonds for $125,000 for carrying out the scheme.—— Walden, N. Y.: A private company is endeavoring to obtain a water-works franchise.——Lowville, N. Y.: The village needs water-works, and a meeting will be called to consider the question.——Batavia, N. Y.: The postponed election upon the question of expending $10,000 for a new pumping engine for the water-works took place January 28.——Fairport, N. Y.: The water-works question is again being agitated.——Lockport, N. Y.: The mayor has been instructed by the common council to appoint a non-partisan committee of six to investigate the different methods proposed for supplying the city with pure water.——Niagara Falls, N. Y.: The stock of the Niagara Falls Water-Works Company has been purchased by the Cataract Construction Company, which proposes to extend its works and furnish a supply of water to the village in connection with the supply necessary for the manufacturing district and increasing population of the proposed new city. ——Albany, N. Y.: The special water commission favors the project of taking a supply of water from the Normanskill at French's mill, in the town of Guilderland. The engineer's report and survey show that convenient levels are obtainable, and that the water can be brought to the reservoirs in the city by gravity, by the building of a dam twenty-eight feet in height at French's mills. ——Lebanon, Pa.: Plans for a large reservoir have been made by the city engineer.——Holland, N. Y.: The Holland Water-works Co. proposes to build works, commencing construction about May. The supply will be from springs, and the cost is estimated at $10,000.——Hickman, Ky.: The city is considering a proposition for the construction of a system of water works. George Warner can give information.——Brunswick, Md.: The Brunswick Water Co. proposes to build gravity works, costing from $6,000 to $9,000. The plan includes a reservoir.

BIDS AND CONTRACTS.

East Orland, Me.: Sealed proposals will be received until 12 o'clock, noon, of February 16, 1891, for the construction of two buildings on the property of the United States Fish Commission at East Orland, Me. Specifications, plans, blank proposals and full information will be furnished on application to the postmasters at Bangor, Bucksport and Ellsworth, Me., respectively, Marshall McDonald, Commissioner.——Ellsworth, Kan.: Bids for water works construction on the reunion grounds of the G. A. R., will be received until Feb. 10. A. R. Greene, Secretary G. A. R. Trustees, Topeka, Kan.——Boston, Mass.: Bids will be received by the Board of Metropolitan Sewerage Commissioners, 93 Lincoln street, until February 14 for sewer construction. Howard A. Carson, Chief Engineer.——Washington, D. C.: Sealed proposals for an electric lighting plant for the Norfolk navy yard will be received until Feb. 13. Address N. H. Farquhar, Chief of Bureau.——Statesville, N. C.: The city will receive bids until February 21 for the construction of a system of water-works. D. A. Miller, Mayor.——Toledo, O.: Bids for sewer construction are open until Feb. 9. C. H. Durian, Clerk of City Council.——Clarlotte, N. C.: Sealed proposals will be received at the office of the Supervising Architect Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 11th day of February, 1891, for all the labor and materials required to complete the approaches to the U. S. court-house, post-office, etc., building at Charlotte, N. C., in accordance with the drawings and specifications, copies of which may be had on application at this office or the office of the superintendent at Charlotte, N. C. Jas. H. Windrim, Supervising Architect.—— Eastport, Me.: Sealed peoposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 12th day of February, 1891, for all the labor and materials required for the stone and brick masonry of the superstructure, also for the iron floor, ceiling and roof construction, floor arches, etc., for the United States Custom House and Post Office building at Eastport, Me., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Eastport, Me. Jas. H. Windrim, Supervising Architect.—— Brooklyn, N. Y.: Sealed proposals for furnishing the necessary materials and erecting steam heating apparatus in the armory for the use of the Twenty-Third Regiment of the National Guard, in the city of Brooklyn, N. Y., may be sent by mail or delivered in person up to 12 M., on Tuesday, the 10th day of February, 1891, at the office of Major-Gen. Josiah Porter, adjutant-general S. N. Y., 280 Broadway, New York City, at which time and place the

commissioners constituted to erect such armory will meet in public session and will receive and open all proposals. Plans and specifications may be seen and printed copies of the specfications may be obtained at the present armory of the Twenty-third Regiment, 171 Clermont avenue, Brooklyn, N. Y., and at the office of the architect, Hon. I. G. Perry, in the Capitol at Albany. Proposals must be addressed to the undersigned, Josiah Porter, Adjutant-General, S. N. Y.——West Point, N. Y.: Sealed proposals, in triplicate, subject to the usual conditions, will be received until 12 o'clock, noon, on the 9th day of February, 1891, for the erection of a 24-bed Post Hospital. Inclose proposals in envelope marked "Proposals for Erection of a Regulation Post Hospital," addressed to the undersigned, W. H. Miller, Captain and A. Q. M. U. S. A.——Providence, R. I.: Sealed proposals will be received until 12 o'clock M., Thusday, February 12, 1891, for building the outlet portion of Section 1, and for building Section 2 of the "Improved Sewerage System" of the city of Providence, in accordance with the form of contract and specification to be furnished by the Commissioner. Plans may be seen and specification and form of contract can be obtained at the office of the City Engineer in Providence. John A. Coleman, Commissioner of Public Works.——Fort Reno, O. T.: Sealed proposals in triplicate, subject to the usual conditions, will be received until 12 o'clock, noon, Thursday, Feb. 5, 1891, for furnishing material and labor required in the erection and completion of two buildings for non commissioned staff officers' quarters and one building for a bath house at Fort Reno, O. T. Proposals should be addressed to the undersigned or to the post quartermaster, Fort Reno, O. T. C. W. Foster, Quartermaster, U. S. Army, Chief Quartermaster. ——Washington, D. C.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P.M. on the 5th day of February, 1891, for all the labor and materials required for the erection and completion (except heating and ventilating apparatus and furniture) of the building for draughting-room in south court-room of the U. S. Treasury Department building at Washington, D. C., in accordance with the drawings and specifications, copies of which may be had on application at this office. Jas. H. Windrim, Supervising Architect.——Brooklyn, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock, P. M., on the 10th day of February, 1891, for all the labor and materials required to build an annex to the building and completion of the approaches to the U. S. post-office, etc., at Brooklyn, N. Y., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Brooklyn, N. Y. Jas. H. Windrim, Supervising architect.

The juice of raw onions applied to the sting of insects will destroy the poison.

To make paper stick to walls that has been whitewashed, wash in vinegar or salaratus water.

To prevent tin pans from rusting, rub fresh lard on them, and set them in a hot oven until thoroughly heated.

The work of replacing the car stove by a steam heating system has been almost completed in the State of New York, where the car stove has been put under a legislative ban. In New England all the railways are rapidly abandoning the old system, and in Canada considerable progress in the same direction has been made. In the West and in the Middle States, however, but little has been done in this field during the past year.

M. de Montlurin, of Pont de Veyle, loved his bottle; he fell sick and called in a physician. The doctor was cruel; not only did he interdict wine for his client, but he prescribed hot water in large quantities. Madam de Montlurin. desirous of carrying out the prescription of the physician, soon after the departure of the latter. appeared at her husband's bedside with a large glass of limpid and beautiful hot water. The patient rose in bed, and, taking a swallow, commenced to gag. After handing the glass back to his wife, he said reproachfully: "My dear, keep the remedy for another time. I have always heard it said that it is dangerous to trifle with medical remedies. Hand me the brandy and soda. If I must die, I do not desire death by drowning." The patient recovered without the hot water or a physician.—*Cin. Lancet and Clinic.*

LIGHT HEARTS AND PLENTY MONEY.

Mr. Editor:—I have just completed my first week's work with my Plating Machine and have $42 profit as a reward. I am charmed with the business; the work is easy and profits large. I bought my Plater from W. H. Griffith & Co., Zanesville, Ohio, for $3, and I feel confident if people only knew how cheaply they would get a Plater and how much money they could make with it, we would see many happy homes, "where penury now exists." It is surprising the amount of tableware and jewelry people want plated, and if persons now idle would send to the above address and get a circular, and go to work, they would soon have light hearts and plenty money.

Mrs. J. C. Noble.

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A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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THERE are many readers of THE SANITARY NEWS who are deeply interested in the cause of sanitation, who are not plumbers, but who support the advancement of high grade plumbing, and recognize in the competent plumber an important sanitary agent. THE SANITARY NEWS has a wide circulation among this class and it appeals to them in the matter of amendments to the city ordinance regarding the increase of sanitary inspectors and the appointment of practical plumbers. There can be nothing more reasonable and more sensible than the appointment of plumbers to inspect plumbing. Defective plumbing is the cause of the vast majority of ills that afflict the city home. If there were no plumbing in the city, there would be but little need of inspection of any kind. If the plumbing work is to be inspected, who is better qualified to do it than the practical plumber? If a plumber, with years of experience in his trade, is not qualified to inspect the work he has been taught to do, who is? The truth is the plumber is the only one who is properly qualified by experience and education to render this service intelligently and efficiently; and if it is important to have plumbing work inspected, which no one can deny, it is essential that practical plumbers be employed to perform that service. It should be remembered that, as the ordinance now stands, no provisions are made for the appointment of any plumbers as inspectors. It is to the good judgment and sound sense of Mayor Cregier and Health Commissioner Wickersham, voluntarily exercised, that Chicago owes the valuable services it has received from its present corps of plumbing inspectors. This service has been so valuable that it is deemed proper that the appointment of a specified number of plumbers be made mandatory by municipal law, so that the commendable act of our present officials may not become a precarious custom but a permanent statute.

ABOUT as neat a compliment as has ever been paid anybody was recently paid the master plumbers of England by the Postmaster General. At a meeting of the Plumbers' Company in London, the Postmaster General, in speaking of the plumbers and the Lower House, said: "I hope that in the future the Lower House will do as much for the plumbers as the plumbers have done for the Lower House." The Lord Mayor, who was also present, in acknowledgement of the toast in honor of the civic authorities, spoke warmly in favor of the work of the Plumbers' Company and said: "If London is to maintain her position at the head of the commercial world, we must pay all possible attention to, and do our utmost to promote, the development of sanitary science." It is a healthy indication to see the interests of sanitary plumbing thus impressed on such high officials.

THE benefits arising from the appointment of plumbers for the inspection of plumbing are not at all problematical or matters of speculation. The plan has been tried and the results most abundantly justify the appointments. Never before in the history of Chicago has sanitary inspection meant so much or accomplished so greatly. Chief Inspector Young with his plumber-inspectors has rendered a service to the city the value and perfection of which were limited only by the insufficient number of inspectors at his command. His administration has been marked by intelligence, justice and courage. While he has caused no one to suffer unduly or unjustly by the enforcement of the laws, he has permitted no one to suffer from a lack of their enforcement. His inspectors have rendered intelligent and efficient service, and, as far as their number would permit, their work has been highly satisfactory.

"EVERY man to his own trade," is an adage as true as it is old, and we know of no better way of utilizing its wisdom than in the appointment of plumbers for plumbing inspectors.

WE are in receipt of a number of letters commending THE SANITARY NEWS for its advocacy of the appointment of plumbers for plumbing inspectors and providing for the same by municipal law. Some of the letters came from unsuspected sources, and they are a healthy sign in the advancement of sanitation. We have not room for all of these letters, but on another page will be found a fair sample of them. It sets forth a case directly in point which is a strong illustration of the wisdom of employing practical plumbers for inspectors. We commend this letter to all interested.

IT IS most gratifying to note that the journeymen plumbers of Chicago are in hearty sympathy with the movement for advancing the plumbing interests of the city in the direction of sanitary reform. The journeymen are awake to the demands of the times in the matter of advanced sanitary plumbing and are abreast with the progress of the present day, and in the appointment of sanitary inspectors the qualifications of the journeymen plumbers will not be overlooked.

THE proposed amendments to the city ordinance regarding the increase of sanitary inspectors, and the appointment of a specified number of practical plumbers should receive the entire public support.

PLUMBERS FOR INSPECTORS.

The movement looking toward the increase of sanitary inspectors for Chicago is an important one, and should receive an honest and intelligent consideration. No one at all acquainted with the extent of Chicago—the remodeling of buildings, the erection of new ones, old ones constructed before the modern sanitary regulations went into effect, continued repairs necessary, and other matters subject to sanitary inspection—can doubt for a moment that an increase of the force is an absolute necessity. The demand for this increase is not only reasonable, but it is essential for the promotion of public health. The sanitary condition of every building in the city should be known, and it is only through competent inspection that this can be learned. If a building be found to be in an unsanitary condition, the cause must be known before the remedy can be applied. The physician cannot cure a disease unless he knows what the disease is. In order to determine this, he makes an inspection, a diagnosis, and can then proceed intelligently to apply his remedies. So, if a building be diseased, the sanitarian or health officer must know what the disease is, the cause, in order to apply the proper remedy. To determine this, he proceeds as the physician, makes a diagnosis, an inspection, determines the nature of the evil, and is then in a condition to proceed intelligently with the proper remedies. Every building in the city is subject to become the patient of the health officer. Every one is under his care. It is impossible for him personally to make inspections. This must be done by a sufficient number of efficient inspectors. It will be recognized that the increased number of inspectors suggested in the amended ordinance is not more than the importance and extent of the work demand. Double that number could easily be kept busy.

The importance of thorough inspection and perfect sanitary service is not fully understood by many whose official duties call them to provide the means of securing these. It is not sufficient to keep only a portion of the city in a good sanitary condition. The ends of sanitation are not attained if there be one building in the city whose hygienic condition is bad. Epidemics have sprung from one unsanitary dwelling and spread over cities. Not long since, a case was recorded where an epidemic of typhoid fever had its origin in a defective joint of a single soil-pipe. From one polluted well, from one cesspool, from the defective plumbing of a single dwelling, epidemics of contagious diseases have originated, and spread suffering and death throughout a city. So it may be expected to befall any city, at any time. Thorough inspection is the only means of preventing these calamities, and that cannot be had with an insufficient number of inspectors.

If it be admitted that the number of inspectors should be increased, as it surely will be, it may yet remain a question as to what persons should be selected to fill these responsible and important positions. The amendment suggested provides for thirty-five sanitary policemen, twenty-five plumbing inspectors, thirty-four factory and tenement inspectors, and five female inspectors. The twenty-five plumbing inspectors are thus specified because no provision now exists for plumbing inspectors at all. This provision is a wise one, for it is reasonable to suppose that plumbers are the best inspectors of plumbing. It is their trade and their business to know good plumbing from bad. They do know this, and are the proper persons for this position, and the only ones who should be appointed. It is just as important to have practical plumbers for plumbing inspectors as it is to have good plumbing. The importance of having good plumbing, and, consequently, plumbing inspectors, will be understood when we realize that nine-tenths of insanitary buildings are caused by defective plumbing. If a city could procure proper plumbing for every house in it, its security from disease would be increased a hundred-fold. The ideal city is one whose sewerage and house-drainage is perfect. There is nothing in the whole range of sanitary science so important as good plumbing. To secure this, it is absolutely necessary to have the plumbing inspected by inspectors who know what good plumbing is. If practical plumbers do not know, who does?

The Sanitary News is disposed to go further than the amendments go, and suggest that one-half of the thirty-four tenement and factory inspectors should be practical plumbers. In fact, a knowledge of plumbing should be a qualification in favor of any sanitary inspector.

Every citizen of Chicago should be interested in this matter. Of course, it costs something, but it is not money thrown away. Every dollar properly spent in this work is a good investment, and will bring good returns. On it will be declared a greater dividend than on any other investment that could be made, and no city can bestow a greater boon upon the citizens than adequate sanitation.

NOTES AND NEWS.

It has been found that a larger amount of vegetable growth is found in artesian wells when the water is warm than in ordinary ponds or tanks.

A French savant has discovered that the phosphorescence in crustacea is owing to the presence of bacteria in the muscles—in other words, disease.

Yeast was discovered fifty years ago to be composed of minute oval particles endowed with life, and the recent bacilli investigations have again turned attention to the subject.

Wire rope manufacturers say that the dread of insects and infection in ordinary rope has banished the latter almost entirely from the household in favor of their own production.

Drapers and others showing window goods liable to lose color by fading, are advised to put yellow-colored glass in their windows, as the bleaching is caused by the white rays of the sun's light.

A recent outbreak of typhoid fever in the garrison at Caen has been made the subject of a report by the Academie de Medecine in Paris by Dr. Brouardel, who has ascertained that it was due to wells contaminated by sewage.

The digestibility of starch is greatly increased by prolonged cooking says Dr. N. Butiagin, and since the ptyalin value of saliva is diminished by disease, starchy foods for invalids should be well boiled, in his opinion, three or four times as long as ordinarily.

The Thirteenth Balneological Congress will meet in March, 1891, at Berlin, under the presidency of Prof. Lubreich. Notices of papers intended to be presented should be sent to Dr. Brock, Schmidstrasse 47, Berlin.

The French medical journals report another instance in which diphtheria appears to have been transmitted from pigeons to man. One of these birds died and a veterinary surgeon found, *post-mortem*, that diphtheria had been the cause of death. From this bird, its owner, his daughter and a child were infected.

In the University of Coimbra, Portugal, fourteen years are now required to obtain the degree of M. D., six being spent in obtaining the ordinary education, three in a preliminary scientific course and five in purely medical studies. Now the students complain because the final examination is conducted in Greek.

No kissing ever occurs in Japan, except in the marital embrace, not even between a mother and child, no shaking of hands in solution. If one were to offer a kiss to a Japanese maiden she would probably think she were going to be bitten!

There is an instructive lesson in the English mortality returns from tuberculosis for the last forty years. In the ten years from 1851 to 1860, the number of deaths from tuberculosis in persons from 15 to 45 years of age amounted to 3,943 in every million; from 1861 to 1870 it had fallen to 3,711; from 1871 to 1880 it was 3,194; and from 1881 to 1887 it did not exceed 2,666. The decreased rate is more markcd in the female than in the male sex.

The examination of Vichy water in bottles, commenced in Germany by Reinl and in America by Ninges, has given alarming results, nearly all of the bottled mineral waters having been found to be charged with germs (*Progres Med.*—N. Y. Times). Temperature, pipes, pumps, &c., are elements of much influence on the number of germs in the bottled waters. It is recommended to modify the methods of bottling, to subject them to steaming, as well as the corks, just before the introduction of the water.

Dr. J. W. Prendergast, Health Officer of Cincinnati, has influenced the authorities to refuse a license to a lecturer on hypnotism, and the lectures have been stopped. Dr. Prendergast has taken the ground that hypnotism is injurious when applied indiscriminately, as it affects the mental health of the objects.

Upon recommendation of Health Officer Prendergast, the City Council of Cincinnati passed an ordinance making it a misdemeanor to give hypnotic exhibitions.

By a unanimous vote of the Society taken at its meeting on Saturday, January 17, it was determined to publish the proceedings weekly instead of monthly—the process that has been in vogue during the past year. It was also voted to employ an editor to revise, condense, and edit the transactions for their publication in proper and reasonable shape.

Dr. Doremus has recently found that sodium fluorides and other fluorides can be used with advantage for softening hard waters. According to *Industries*, he finds that the precipitation of magnesium is especially thorough, and that this resgent does not present any of the serions difficulties that are met with in the practical use of lime, soda ash, and caustic soda. The patentee at first experienced some difficulty in obtaining this resgent in large quantities at a reasonable rate; but states that he has now induced manufacturers to supply this compound in large quantities at a figure which will not prove prohibitive to the consumer.

The use of iron in the construction of the walls of dwelling houses has hitherto been unknown in Berlin, Germany, small structures, such as kiosks, built up of corrugated sheets, or temporary buildings of iron and glass, being the only purposes to which the metal has yet been applied in this connection. A new departure is, however, being made by a Berlin builder, who is constructing five residences of three stories each, the walls of which are formed of iron plates and the floors of iron girders. The plates are lined inside with wood, but in other respects the usual building materials are dispensed with. It is claimed for this style of building that greater security against fire is obtained, with unusual resistance to the destructive influences of the weather.

DISPOSAL OF SEWAGE.*

A complete system of sewerage should collect the foul waters from an inhabited territory and dispose of them in a satisfactory manner. The collection is accomplished by means of a certain arrangement or combination of pipes or sewers, and the disposal by means of some treatment leading to the purification of the water which has acted as a carrier for the matter removed during cleansing operations from the person, his clothing, and his habitation.

Most of the organic waste matter thus taken up by the water is so finely comminuted, if it is not actually in solution, or itself a liquid, that it is at once seized upon by swarms of bacteria, and finally decomposed into inert matter which is inoffensive or harmless to us. In serving as food for bacteria, however, it increases their prevalence in our midst. This fact would be beneficial if all of them confined their task to the annihilation of sewage. But there are certain bacteria which, if permitted, will also seize upon the living blood and tissues of higher organisms, producing cases of zymotic disease, a certain percentage of which terminate fatally.

It is therefore necessary for the health of the community to prevent decomposition of organic matter as much as possible, under circumstances which contribute to the spread of bacteria in our midst. For this reason the sewerage system should be designed, constructed, and operated so that the waste matter, from the time that it enters the pipes within the dwellings, should be carried swiftly, and with a minimum of opportunities for retention or deposit on the way, until it reaches a point where it can safely be purified, The engineering problem, so far as it concerns the sanitary features of the system, is thus determined.

The design should aim to cause the water to flow with a sufficient velocity, so that the heaviest of the ordinary matter will be carried in suspension to the point of disposal, and thus prevent deposit and consequent foulness within the sewer. There is a fixed relation between the velocity of the fluid and the matter which it will carry in suspension. Thus, sand will be carried along by a stream of water flowing with a speed of six inches per second, but be deposited if the velocity becomes less. Pebbles one inch in diameter are carried along by a flow of about two feet per second, and are deposited if the velocity is less. The sewers should, therefore, have a certain minimum inclination or fall. They should also have a sectional form which will concentrate the sewerage laterally into a compact stream, instead of allowing it to spread out in a thin sheet. All changes in the direction of the flow should be made in such a manner as to prevent eddies, or a material reduction of the velocity. The interior surface of the sewer upon which the sewage flows should be as smooth as it is practicable to make it, because roughness causes particles to be held back. It would likewise be desirable, but engineering science has not yet solved the problem, to prevent a smooth surface from allowing the adhesion of mycelial and other growths forming a slimy surface, and thereby again causing the adhesion of passing matter.

In spite of the greatest care in building and in maintenance, some decomposition will always occur in sewers, and we must, therefore, provide for cleansing, both by ventilation, to dilute and remove offensive gases, and by flushing, to produce an increase of the ordinary amount of velocity of the water, and thereby cause it to again take up and remove matter which has been deposited. Ventilation is usually obtained by facilitating the natural circulation of the air within the sewers. This circulation is caused by a difference of temperature and of humidity within and without the sewers, and under certain conditions by impulsion, due to the flow of the water. Artificial ventilation has rarely been a success, owing to the necessary complication in the arrangement of the pipes within the houses and in the streets. Flushing is usually obtained by causing the sewer to run more than half full for a short period of time, either by temporarily damming the sewage, or by suddenly introducing other water in large quantities.

This first part of the problem, namely, the collection of sewage, is comparatively simple, but the second part, pertaining to the final treatment with reference to purification, is far less so. It has been the subject of much controversy and of many experiments. Until recently, when bacteriology had sufficiently developed to throw some light upon the matter, the discussions were generally unscientific, based upon assumptions rather than facts, and often guided by self-interest, with consequent misrepresentations of facts.

For a long time the principal efforts were directed toward converting sewage into manure. It was thought that, besides being a satisfactory solution of the sewage question, great profits could be made from such a conversion. In Europe "dry removal" of the nightsoil or solid matters was frequently urged. This allowed manure to be manufactured from sewage at a smaller cost than if the solid matter were combined with the wash water from kitchens, laundries, bed-rooms, etc. But this water was still left unprovided for, and formed sewage about as offensive as when it contained the more solid matter. A good example of this may be seen in Paris, where most of the excrementitious matter was, and, I think, still is, separately collected and disposed of as manure, but where the sewage in the sewers is so foul that the river Seine, below the outfalls, is made black in color and offensive to smell. England, which has generally been in the lead in sewerage matters, has only a few localities retaining the system of dry removal. But in every such case it still leaves unsolved the purification of the large amount of dirty waste water which is discharged from the buildings of a modern city well supplied with water, and which virtually makes up the sewage thereof.

The quantity of sewage which it is necessary to deal with is approximately measured by the quantity of pure water supplied to the inhabitants. Gaugings have shown that the two correspond closely. Sometimes the natural soil is very wet, and when drained into the sewers increases the quantity of sewage. Elsewhere the ground may be dry, the rainfall scanty, and much of the water supply used for sprinkling, which diminishes the quantity of sewage; but on an average the relation is nearly constant, and furnishes a good measure for projected schemes of sewage purification.

In European cities the water consumption ranges from twenty to fifty United States gallons per day per head of population, and in American cities from fifty to one hundred and fifty gallons.

* Wrttten for the State Board of Health of California by Rudolph Hering, Civil and Sanitary Engineer of New York.

The greater figures for our own country are due partly to a more liberal use of water and partly to the waste caused by a lack of restrictive measures. While we may in the future prevent much of this waste, we will hardly curtail, to any great extent, the amount of water supplied, as in a modern community the legitimate uses for it are continually increasing in number. In comparing the results of sewage purification in Europe with those of our own country, we must therefore not forget the relative quantities of sewage which have to be dealt with.

Probably the oldest method of disposing of the waste waters, though imperfect in detail, was the application to land, or simple irrigation. In Italy and Spain, and some parts of Germany and France, more or less crude methods were occasionally practiced. The object of irrigation was profit rather than sewage purification, and therefore the requirements for the latter were left substantially undeveloped.

Toward the middle of the present century, when cities began their modern rapid growth, the question of purification of sewage forced itself upon the communities. This was particularly the case in England, where many towns, using rivers as sources of water supply, also used them as the most convenient depositories for their waste water, to the detriment of the towns below.

Broad irrigation was recommended and applied with more or less success. The leading idea was to have vegetation absorb, and thus to dispose of the sewage as it was delivered upon the fields. One acre was considered necessary for the sewage from about one hundred to two hundred persons. But not everywhere was suitable or sufficient territory to be had, and seldom was this method of disposal found to pay the cost of properly applying the sewage to the land.

It was then suggested in England that in porous soil sewage could be purified by filtration, and would require much less territory, namely, one acre of land might serve for from six hundred to one thousand persons, according to the porosity of the soil. This method was found to be successful in purifying sewage when the ground was carefully prepared in level beds and furrows, and underdrained, and when the application was intermittent.

Where no porous ground was obtainable, or where its preparation was too costly, filtration was not feasible, and still other methods of purification had to be sought. It was known that milk of lime, salts of iron, and other chemical agents, would coagulate some of the albuminous compounds, precipitate organic matter, and thus clarify the liquid. The deposited "sludge" could then be treated as manure. A multitude of processes for precipitation were patented, and some were practically tried. The general results in brief were these: The clarified liquid was still more or less impure, and soon putrefied if left standing. If discharged into a river, however, and diluted with fresh water the discharge was not objectionable. The deposited matter, or "sludge," was, however, rarely of sufficient value as manure to justify the expense of drying and preparing it for the market. Owing to the cost of the chemicals and of handling the sewage, the cost of precipitation was often prohibitory.

In the meantime, those cities which were situated upon large rivers or on the coast, disregarded all methods of land and chemical treatment, and turned the crude sewage directly into the passing currents of water, generally because it obviated the cost of providing special works for purification.

Each of the three above mentioned methods of sewage disposal began to have its advocates, and we can find a voluminous literature setting forth the advantages peculiar to each. An impartial observer examining the various executed works for sewage disposal would come to about the following conclusions:

Each one of the above methods has merits, and is capable of accomplishing the desired object under favorable conditions. A preference of one over the other should rest upon the desired degree of purity and upon the relative cost. Where a direct discharge into a large river or into the sea is not objectionable, it will generally be the least expensive method of disposal. Where such a discharge is impracticable, either a partial or a complete purification can be obtained by straining the sewage through screens, which will prevent floating matter from stranding upon the shores or in shallow places. A much better partial purification is obtained by collecting the sewage in tanks and treating it with precipitants. The effluent water in this case can be made clear and discharged into a stream or along the ocean beach with impunity. Where the stream is to be thereafter used for a water supply the effluent from precipitation works is usually unsatisfactory, unless it can afterwards be subjected to land filtration.

Filtration through land unquestionably accomplishes a greater degree of purification than can be obtained by any other method of treatment. If the conditions are favorable, the soil suitable, and the management good, the purification can be made complete, and the effluent safely be discharged into any stream furnishing potable water.

While existing sewage works, if carefully compared, lead the observer towards these conclusions, we are now, through our recently acquired knowledge of the bacterial action upon sewage, also able to explain them, at least partially.

A jar of fresh sewage if left standing in a warm room soon becomes putrid. The number of bacteria increases until a maximum is reached, after which the water assumes a clear color, and a sediment forms on the bottom. After a sufficient time the main body of water is practically free from putrescible organic matter and bacteria, and contains in solution but the gases, which are the products of decomposition. This purification is hastened by warmth and aeration, and it is retarded or prevented by cold and lack of oxygen—conditions which are respectively favorable and unfavorable to the development of germ life.

If sewage is sterilized by boiling or otherwise, and retained in this condition, no purification takes place. It is therefore necessary, first, to provide conditions which are favorable to the life and action of bacteria upon the sewage; and secondly, to prevent the resulting decomposition from being offensive, through an absorption of the gases, either by large bodies of water or by the soil. With these requirements as a basis we can arrive at some practical results.

The discharge of sewage into large bodies of water will not be objectionable if the dilution is great enough to supply the required oxygen, and to absorb all the gases of decomposition. When the temperature of the water is high, bacterial action is more rapid and the dilution required greater than when the water is cold. This fact is demonstrated by comparing the condition of streams or lakes receiving sewage in southern with those in northern latitudes. A warm current will, therefore, show a complete purification to have taken place earlier along its course than a cold one in which bacterial action is retarded; instance the summer and winter conditions of the canal and the Desplaines River, which receive the sewage of Chicago, and where the polluted condition can be traced much farther down stream in winter than in summer.

Further, as salt water is not favorable to the life of bacteria, purification is slower, and sewage remains therein in a decomposing condition for a longer time than if the water is fresh. Coves and bays receiving sewage are, therefore, apt to become foul sooner in salt than in fresh water. Therefore, again, if a constant current could be obtained to dilute the sewage and to carry it away, less water would no doubt accomplish the object satisfactorily in salt than in fresh water. Unfortunately, we have very few precise measurements referring to this matter, and even if we had many, the conditions are generally so different that they seldom permit a direct comparison. We must depend upon results derived from experiments on a small scale and from general comparisons, and for the present be content to draw our fundamental conclusions only from relative instead of absolute data.

[Concluded next week.]

SEWAGE DISPOSAL.

Col. Geo. E. Waring, Jr., Consulting Engineer for sanitary and agricultural drainage, has been asked to approve a scheme for the sanitary improvement of a town situated on land having a long moderate slope, with abundant water lying in two strata underneath it, the first at a depth of ten to thirty feet through fine gravel and quicksand, and a lower one distinctly separated from it by an impervious formation, consisting of a coarser gravel containing good water.

In the village days the water supply was taken from the first

stratum. This has become impure, and the town is now supplied from pumps sunk into the lower stratum, apparently at the down stream side of the town area.

The proposition referred to him is, in view of the great cost of sewerage, and as the surface wells are practically all abandoned, to use these old wells as a means for delivering the sewage from the houses into the upper water-bearing stratum, which has a continuous flow towards a river two miles distant.

The following is extracted from his reply:

If the first porous layer into which your wells are now driven was made of cobble-stones and coarse pebbles, instead of fine gravel and quicksand, and if the flow of water through it were much more copious than it can be now, it would probably be safe to use your wells for sewage if you give them an abundant flushing every day and wash all adhering matters well into the underground flow.

Under the conditions you describe, the wells would sooner or later become clogged with grease and slime, which would hold back sewage, and in any case, the fouling of the wells and of the water standing in them would be serious. I do not understand that fresh sewage is "wholesome." It probably contains a great variety of microbes, and, if there are typhoid dejections, there will be a swarm of the typhoid bacillus, giving a directly dangerous character to the sewage. Sewage becomes more offensive and more difficult to treat after putrefaction, but it is not certain that it becomes more dangerous. Then again decomposition would not be prevented by the temperature of your wells.

I have had, within a few years past, to consider professionally the cases of two towns where such disposal as you suggest had been recommended. My conclusion in both cases, after considerable study, was as given above.

I must also disagree with your opinion that sewerage is not available for your town because of its cost. Of course there is much outlying property where sewers would not now be built, but everything must have a beginning, and you could certainly make a large beginning in those districts where there would be, on the average, one house to each hundred feet on each side of the way. In a soil such as you describe, sewers would probably cost on the average not more than 80 cents per foot. This would make the cost for each lot averaging 100 feet in width $40, an investment which would be amply covered by a tax of one cent per day on the lot holder. It would save the cost of "health wagons," of cesspools and of scavenger service, and would give you a result which could in no other way be so cheaply and so efficiently secured.

On general principles, it is advisable to locate water-supply wells on the upstream side of the town, but if the water flowing through the second stratum is pure as it arrives, there seems to be no reason to apprehend it becoming impure because of impurities in the upper stratum.

Osmosis will not carry infection, nor, through a medium of such thickness, soluable organic matter.

Should biological examinations of the water supply indicate that, through a fissure or otherwise, water from the upper layer had reached and contaminated the lower layer, the natural remedy would be to remove the pumps further up stream.

Renewing my regret that I am not able to agree with your propositions, I am,

Very truly yours,

GEO. E. WARING, JR.

TO REGULATE PLUMBING.

The following ordinance for the regulation of plumbing in Worcester, Mass., was adopted December 23, 1890, and is now in operation:

SECTION 1. The Board of Health may license proper persons to carry on the business of plumbing.

SEC. 2. No person shall carry on the business or do any work of plumbing unless he shall have first obtained a license and registered his name and place of business in the office of the Board of Health, and notice of any change in the place of business of a registered plumber shall be immediately given to said board; provided that this section shall not apply to employes while working for licensed plumbers.

SEC. 3. Every building used as a dwelling in which plumbing arrangements are to be placed shall be supplied with a water-closet for every fifteen persons, conveniently located and constantly supplied with water. All water-closets constructed after the passage of this ordinance must be supplied with water from a special tank or cistern, not used for any other purpose, unless permission has been obtained from the Board of Health to use other fixtures. It shall, in all cases, be connected directly with the general or common drain-pipe of the house. The use of pan-closets is prohibited.

SEC. 4. When the water-closet is located twelve (12) or more feet from the soil or drain pipe, the trap must be protected from syphonage by a special air-pipe of not less than two (2) inch bore. The common drain-pipe shall be separately and independently connected with the public sewer wherever such sewer is provided, and, if there is no such sewer, with a properly constructed cesspool of a capacity approved by said board.

SEC. 5. Every water-closet shall be provided with a local vent, the material of which shall be copper, cast-iron or galvanized iron. The diameter of this vent shall be for one closet not less than two (2) inches, for two (2) and not more than four (4) closets not less than three (3) inches, and for any number exceeding four, such increased diameter as the board may direct. It shall be carried upward and into a heated flue provided for the purpose, or into the kitchen chimney. In either case it must be entered above the highest opening in said chimney, or in such other manner as said board may direct.

SEC. 6. Where it is necessary to lay soil-pipe under the ground, it shall be of a quality known as extra heavy pipe. The pipe passing through the walls of the building, and to a distance outwardly of at least ten (10) feet from the inside face of foundation walls, shall also be extra heavy. All cast-iron pipe must be sound and free from holes and other defects, of a uniform thickness, and of not less than the weights specified below for the corresponding diameters, and before use shall be thoroughly coated inside and out with coal-tar or an equivalent substance.

EXTERNAL DIAMETER.

Ordinary Pipe.		Extra Heavy.	
2 in.,	3½ lbs. per foot.	2 in.,	5½ lbs. per foot.
3 in.,	4½ " "	3 in.,	9½ " "
4 in.,	6½ " "	4 in.,	13 " "
5 in.,	8 " "	5 in.,	17 " "
6 in.,	10 " "	6 in.,	20 " "

SEC. 7. Drain and soil pipes through which water and sewage is used and carried shall be of sound iron when within a building, and at least four (4) inches in diameter. They shall be securely ironed to walls, or laid in trenches of uniform grade, or suspended to floor timbers by strong iron hangers, or as said board may direct. The space between these hangers shall not exceed ten (10) feet. They shall have a fall toward the drain or sewer and soil pipes, shall be carried out through the roof open and undiminished in size to a distance of not less than two (2) feet above the roof, or more if said board shall so direct. Changes in direction shall be made with curved pipes, and all connections with pipes shall be made with Y branches.

SEC. 8. All vertical branch lines of soil-pipe twelve (12) feet or more in length must extend up through and two (2) feet above roof, undiminished in size, or more than two (2) feet if said board shall so direct, or they may be connected with main soil-pipe above the highest plumbing fixture. All branch lines of waste-pipe fifteen (15) feet or more in length must be carried up through and two (2) feet above roof or into main soil-pipe, above highest plumbing fixture. When two or more fixtures, such as sinks, bowls or baths are used on one line, the waste-pipe must be of iron and not less than two (2) inches in diameter. All pipes must be four (4) inches in diameter where they pass through the roof.

SEC. 9. When the house-drain is trapped, it must be furnished with a brass clean-out. There must also be provided an inlet at least four (4) inches in diameter for fresh air to enter the drain on house side of trap. This inlet is to be carried to the outer air, opening at such distance from nearest window as will be satisfactory to said board. and where it cannot possibly contaminate the cold-air box of a furnace.

SEC. 10. Rain-water leaders must never be used as soil, waste or vent pipes, and when connected with soil or drain pipes shall be suitably trapped.

SEC. 11. Sewer soil-pipes or waste-pipe ventilators shall not

be constructed of brick, sheet-metal or earthen ware, and chimney-flues shall not be used as such ventilators.

Sec. 12. Joints shall be run with molten lead, packed with oakum, thoroughly caulked and made tight. Connections of lead pipes with iron pipes shall be made with brass ferrules, properly soldered and caulked to the iron. The lead pipe must be attached to the ferrule by a wiped or overcoat joint.

Sec. 13. All connections of lead waste and vent pipes shall be made by means of wiped joints, The joints between the soil-pipe and water-closet shall be made by means of a brass or lead connection.

Sec. 14. Every sink, basin, bath-tub, water-closet, slophopper, and every fixture having a waste-pipe, shall be furnished with a trap. Traps shall be protected from syphonage or air-pressure (when such make of trap is used that is liable to syphonage) by special air-pipes of a size not less than the waste-pipe, but air-pipes for water-closet traps shall be of not less than two (2) inch bore. Air-pipes shall be run as direct as practicable, and shall not be of less than four (4) inch bore where they pass through the roof. Two or more air-pipes may be connected together, or with a soil-pipe, but in every case of connection with a soil-pipe such connection shall be above the upper plumbing fixtures of the building.

Sec. 15. Waste-pipes from refrigerators or other receptacles in which provisions are stored shall not be connected with a drain, soil-pipe or other waste-pipe unless such waste-pipes are provided with traps suitably ventilated, and in every case there shall be an open trap or sink between the trap and refrigerator.

Sec. 16. Pipes and other fixtures shall not be covered or concealed from view until after the work has been examined by an inspector of said board; and the plumber shall notify the board when the work is sufficiently advanced for inspection. When necessarily placed within partition walls, soil and waste pipes must be covered with woodwork so fastened with screws as to be readily removed. In no case shall they be absolutely inaccessible.

Sec. 17. No steam exhaust or drip pipe shall connect with the sewer or with any house-drain, soil-pipe or waste-pipe, but blow-off pipes may discharge into a suitable tank or condenser, from which a suitable outlet to the house-drain may be provided.

Sec. 18. A suitable grease-trap must be placed under the sink of every hotel, restaurant, eating-house, or other public cooking establishment.

Sec. 19. The plumbing must be tested with the water test by the plumber, in the presence of an inspector of said board, and all defective joints made tight. Defective pipe discovered must be removed and replaced by sound pipe.

Sec. 20. All material must be of good quality and free from defects; the work must be executed in a thorough and workmanlike manner.

Sec. 21. Any license granted under the provisions of this ordinance by the Board of Health may be revoked at the pleasure of said board.

Sec. 22. For every license granted under the provisions of this ordinance, there shall be paid to the Clerk of the Board of Health the sum of one dollar for the use of the city.

Sec. 23. All previous ordinances, rules and regulations inconsistent herewith are hereby repealed.

Sec. 24. This ordinance shall take effect on its passage.

Approved December 23, 1890.

SUPPORTS THE PLUMBING ORDINANCE.

Chicago, Jan. 29, 1891. Editor The Sanitary News:—I wish most highly to commend The Sanitary News for its strong and intelligent advocacy of the proposed amendments to the city ordinance requiring the appointment of practical plumbers for the inspection of plumbing. I am no plumber and have no connection with any plumbing firm, or any financial interest in the trade whatever; but I value the health of Chicago and heartily support the best means of maintaining and improving it. It is silly to talk about appointing men to inspect plumbing who do not know anything about the work. Such men will permit the people of this great World's Fair city to live in constant discomfort and danger.

To illustrate what I mean I will give a little experience I had last summer. I became convinced from the offensive smells in my house that something was wrong, and I appealed to the Health Department. A gentleman came, looked about a little and said nothing was the matter, that the unpleasant odor was from the stock yards. I applied again and another inspector came with like result. I was not satisfied, and, through the kind offices of a friend who was acquainted at the Health Department, a practical plumber was sent to my house, and in a few minutes he pointed out an "unvented" trap which lost its seal by syphonage, and showed me a leak in a drain pipe which filled the house with the vile and poison stench that had caused discomfort and sickness in my family.

I think this is a plain, practical lesson, fully demonstrating the wisdom and necessity of having a sufficient number of practical plumbers for inspectors. I am not acquainted with the matter enough to know what that number should be, but, for my part, and in behalf of the health of the city and its greatest prosperity, I would rather see fifty than twenty-five appointed. I am convinced that there is enough work for fifty plumbing inspectors to do, and I am sure that I do not want any but plumbers to inspect my house in the future. If a plumber had first inspected my house it would have saved me a doctor's bill sufficient to have had entire new plumbing put in. I am done complaining about plumbers' bills and cracking old chestnuts about them. I have found their bills less than doctors' bills, and I can advocate their appointment as inspectors from practical observation and a most sad experience. I do not know what salary these inspectors get, but I do know that the payment to them of good salaries would be the most profitable manner in which a goodly portion of the city's income could be expended. Yours, C. R. B.

TRAP-VENTING.

Pineville, Ky., Feb. 1; 1891.—Editor The Sanitary News: Having taken very particular notice in regard to the question of ventilation of traps, syphonage, and evaporation of seals, discussed in the late issues of The Sanitary News, I wish to say, from practical experience, that Mr. Jerrard's idea of ventilating from the crown of traps is improper, and that Mr. Kelley is right in regard to the action of filth closing the vent-opening. I also approve of Mr. Kelley's idea of taking the back-air openings out below the crown of the trap, and in a Y branch. Any practical plumber can see the principle of this. I also do not agree with Col. Waring in regard to traps syphoning, if they have the proper-sized openings for ventilation, as Mr. Kelley states. Mr. Kelley's idea of combination traps I approve of also. His explanation is practical and from experience.

I also claim that a perfect system of plumbing cannot be done by using combination traps unless they are properly ventilated, as one cannot rely on the combination traps; for they will fail to operate when least expected. There is only one way to do a first-class job of plumbing, according to my opinion, and that is to have a perfect ventilated system throughout, and to use a plain S trap, or drum trap with clean-out screws; and if they are properly ventilated, it is almost impossible to syphon them. A job of plumbing done on this plan is sure to be sanitary, gives credit to the master workman and plumber, and is also a safeguard against diseases which arise from inferior plumbing. As I take all my ideas from practical experience, I feel safe in making this statement.

Hoping to hear of all objections, with full explanations thereon, in the next issue of this paper, I am

Very respectfully yours, R. E. Putnam,
Manager Kentucky Plumbing Co.

TRAP VENTING.

A REPLY TO W. A. KELLY.

Editor The Sanitary News: I think that I have written enough on most of the points raised by Mr. Kelly to satisfy those who will take the trouble to consider my writings, that they are not subject to his criticisms.

It may not be improper for me to add that I consider myself in matters of house drainage a thoroughly practical man; that I have no interest whatever in the Sanitas trap, the Puro trap, or any other "combination" trap; and that neither the Sanitas nor

the Puro ever holds any deposit whatever, ever has its waterway reduced, ever approaches the condition of an S trap, or can ever have its seal broken by any conditions occurring in house drainage. Respectfully yours, GEO. E. WARING., JR.

RESOLUTIONS OF CONDOLENCE.

Denver, Col.: Jan. 30, 1891. Editor THE SANITARY NEWS:—The many friends of Joseph P. Ratican will be pained to learn of the sad bereavement he met with in the loss of his most estimable wife, who, after an illness of two days, departed this life after enjoying the married state but one short year.

The master plumbers of the city almost to a man attended the funeral, thereby attesting the esteem in which she was held.

The visiting ladies who attended the late Denver convention will remember her as one of the leading and indefatigable members of the Ladies Auxiliary Committee, sacrificing her own comfort to make happy those whose pleasure demanded her time and energy.

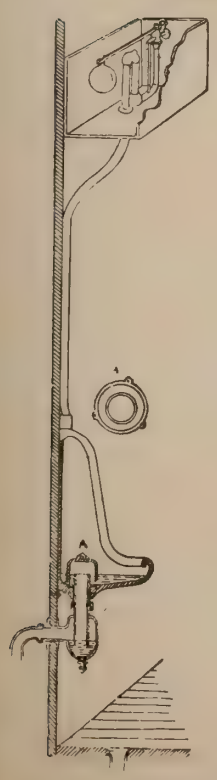
The Master Plumbers' Association adopted the following resolutions and had them engrossed and presented to their bereaved member:

To our Associate, Jos. P. Ratican:

Although unwilling to intrude on the sacred privacy of grief until its first pangs have in some measure subsided, we participate so sincerely in your affliction that we cannot longer keep from expressing to you our heartfelt sympathy; and yet so weak and ineffectual is all human consolation, that we scarcely know how to tender our deep sense of feeling. Yours is indeed a sad bereavement, but we doubt not from your strong faith in Him who doth all things, you will be sustained by His consolation. The recollection of her who has so lately departed must be so full of painful regret, that we will not dwell on the dark side of the picture, but rather look on its brighter aspect, in the hope that she who has gone to a happier sphere, that what is a loss to you is to her an unspeakable gain. We add no more, but our fervent prayer is that you may be divinely comforted in your sore trial, and be roused from your grief by claims of duty to those whose welfare demands your care and affection. Believe us one and all your sympathizing friends.

DENVER MASTER PLUMBERS' ASSOCIATION.
Committee: Thomas J. White, W. F. McCarthy.
J. P. Hughes, President.

TRADE AND BUSINESS NOTES.



The accompanying cut represents Carlisle's syphon urinal with syphon jet automatic flush tank, manufactured and for sale by the Thos. Gibson Company, of 273 Walnut street, Cincinnati, Ohio. As will be seen this urinal is double trapped, making it impossible for sewer air to escape and endanger the health of the occupants of buildings in which it is placed, and when the syphon is discharged it fills the waste pipe to its full capacity. The nature of urinals and their use give great importance to anything of the nature of improvement in this important sanitary fixture, and it is evident that the one here illustrated will command favorable consideration. This company also manufacture the Carlisle pedestal washout closet which is well and favorably known. The closet is simple in design, regular in action, of beautiful exterior with solid pedestal shape leaving no place for the accumulation of dirt or dust. It has a perfect drive wash from back to front, a fine flushing rim and no fouling space, and is provided with brass inlet and vent couplings and with local vent when ordered. This company has long been in the business of general plumbing supplies and their specialties are the products of years of experience and proficient workmanship.

The Pierce Steam Heating Company, of Buffalo, N. Y., has issued a neat pocket edition of its illustrated catalogue of radiators. The company manufactures direct and indirect steam and hot water radiators of the most pleasing appearance and approved designs. The degree of perfection which steam and hot water heating have attained makes the manufacture of a high order of radiators an important matter in the economy of heating and commands special attention from the trade. The idea that "any radiator will do" is far from the truth, and the intelligent man will select a radiator with as much care as anything else belonging to a house. The company has branch offices at New York, Boston and Chicago, and respond to any inquiries regarding their heating apparatus.

The New York Central Iron Works, of Geneva, N. Y,, are the manufacturers of a hot water boiler that has long held high rank among apparatuses for house heating. It is titled the "Dunning," and the 15,000 of these boilers now in actual use is high recommendation of its excellence. A catalogue recently issued presents the merits of this boiler and the advantages of hot water heating.

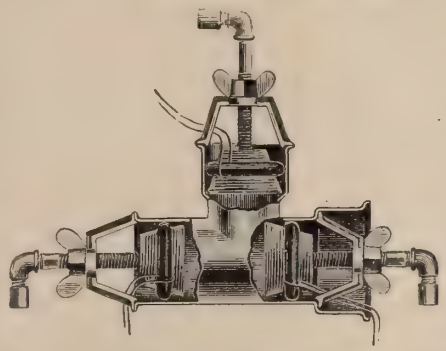
A patent has been granted Peter J. Bode, formerly of Belleville, Ill., now located at 2508 South Jefferson avenue, St. Louis, Mo., on a new form of tongs. The invention lies in improvements in tongs embracing the means of working pipes, etc., in ditches or other crowded and inconvenient places. The special feature is the short handle with lever and connections so constructed that the tongs can be easily used in small places, and by its grip arrangements it saves the labor of several men.

NEW SOIL-PIPE PLUG.

This invention relates to plugs or stoppers for closing the ends and branches of pipes, for the purpose of testing and disinfecting the same, and has for its object the reduction in weight of such stoppers, the more convenient application thereof to use, the automatic tightening thereof when under pressure, and a reduction in the cost of producing them.

The nature of this invention consists in a tapering hollow plug surrounded by an elastic ring, which rolls between the internal surface of the pipes and the external surface of the plug as the plug is drawn outwardly from the pipe, and which tightens by the application of fluid pressure in the pipe.

The accompanying cut shows the stopper applied in various forms—*i. e.*, inside of a bell end, inside of a spiggot end, and also past the bell and down into the pipe. The plug in its external tapering surfaces is of a short or blunt taper, and has small circumferential grooves formed in it, with intervening circumferential ridges, or can be of a longer taper with smooth surface. Fastened securely in the plug is a pipe provided with a thumb-nut resting upon a bridge. The bridge when in use rests upon the end of a pipe or bell-end or upon the shoulder in the bell-end. The pipe fastened in the plugs can be used for introducing the necessary pressure, in the same manner as any other plugs used for like purposes. In applying the plug to use, it is inserted with the larger end inward; the ring is pushed in so as to make contact with the inner surface of the pipe and the external surface of the plug; the bridge is placed in position, and the thumb-nut turned, drawing the plug outward and rolling the rubber ring in the converging space between it and the inner surface of the pipe. Upon application of pressure in the pipe, the plug compresses and rolls the ring, still further tightening the plug against leakage.



In taking the plug out of an outlet, the thumbscrew has to be loosened and the rubber pulled out or loosened up, which is readily done by placing a piece of string around the rubber before it is put on, and when plug is loose take the two ends of the string and pull out the rubber.

From practical tests, this plug has been found to stand a heav-

ier pressure than any plug made. The greater the pressure, the tighter it holds.

The patent for the above plug has been granted to William S. Clark, of the firm of Clark Brothers, plumbers, etc., 218 South Twelfth street, Philadelphia, Pa., who is also the inventor of the celebrated Acme soil-pipe plug.

WASTED ENERGY.

There are many ways of misusing vital power, but hardly one is more prolific of physical disorder and disease than the habit of over-eating.

The majority of people eat about a third too much.

It is well understood by physicians that over-eating is the responsible cause of a large proportion of sickness. The distinguished Abernethy aphoristically says: "One-fourth of what we eat keeps us, the other three-fourths we keep at the peril of our lives."

When more food is taken into the stomach than can be appropriated for the purpose of growth, repair and functional activity, all the organs of digestion, assimilation and excretion are overtaxed to dispose of this superfluity, additional labor is put upon the kidneys, lungs, and other excretory organs, to eliminate unused material which has served no end in the human economy, and this strain long continued leads to an impairment of vigor, and not infrequently to chronic disorders which puzzle the best of physicians to overcome.

It is, therefore, a waste of energy to over-eat, but how many persons are tempted to gratify the palate long after the demands of hunger have been satisfied! It is from this class that a large percentage of invalids is recruited.

Sometimes this excess of nutriment is stored up in an accumulation of flesh, but not always, for very often the effort required in taking care of so much more food than is necessary so taxes the whole system that the person is always exceedingly thin. A smaller quantity of nourishing food, which could be readily digested and assimilated, would give an increase of flesh and a more symmetrical roundness to the whole body. The impression prevails that flesh is a sign of health and strength. On the contrary, an abnormal amount of flesh, above one's average weight, is an indication of ill-health, and it may be accompanied by extreme weakness and inability to work or exercise.

How shall we know when we have eaten enough?

First. Eat to live, and not live to eat. Keep a guard over the appetite, and do not let it take control. That is, do not eat simply because food is agreeable to the taste. Decide what and how much you, as an individual, need, and take that and nothing more. Put your bodily desires under the direction of the spirit, which should always hold the mastery if you hope to have health or happiness.

Second. Having arrived at maturity, a smaller amount of nourishment is called for to keep the tissues in repair than during the period of growth. This can be properly estimated if your normal weight remains about the same month after month. Any marked difference one way or the other indicates the need of medical advice.

Third. Two meals a day will help solve this question for the majority of persons. The objection is sometimes raised that in eating but twice a day, more food is taken than in three meals, but I believe that just the opposite is true when once the habit is well established, and that all the requirements of the system are amply supplied at a great saving of vital power by eating but twice in the twenty-four hours. Only a certain amount of nutrient material is required by the system. It does not so much matter when this is taken, except that by dividing it into two meals instead of three, the stomach, liver and all the other organs concerned in the assimilative and digestive processes are thus secured a period of rest which is absolutely necessary in order to maintain their healthful activity and to furnish functional power on demand.

The average American really dines three times daily, with his beefsteak breakfast, chops for lunch, and roast beef at his six o'clock dinner. And he does it at his peril, for this habit of overfeeding, especially of eating so much meat, is one of the provoking causes of so many sudden illnesses and so many premature deaths. Three meals a day of hearty food is exhausting to all the vital processes, and even the strongest succumb finally to this "wasteful and ridiculous excess."

Abundant material prosperity is in more ways than one the herald of disaster. Physical degeneracy always accompanies the increase of wealth and luxury in any nation, because human beings are so short-sighted that they give loose reins to the physical appetites, which swiftly lead downward.

Americans are a nation of brain-workers and so cannot safely indulge in high living. High thinking, or the constant use of the brain in any direction, calls for a plain but nourishing diet. Brain-workers, especially, ought to live sparingly. Luxurious feeders require much exercise in the open air and freedom from pressure on the brain.

For the aged, or even for those above fifty, luxurious living and over-eating are specially dangerous. As functional activity lessens with increasing years, the supply of food should be decreased accordingly. An over amount that might be borne without disturbance in earlier years often proves fatal in old age.

The hardiest races live on the simplest fare. Frugality in diet, a minimum amount of the right quality serves far more certainly to prolong life, insure health and well-being, than a rich abundance and variety which are accountable in a large measure for the ill-health and dissatisfaction of the present time.—*Laws of Life.*

NEW YORK MASTER PLUMBERS' BALL.

Mr. H. G. Gabay, the newly-elected president of the Association of Master Plumbers of the City of New York, has written us an account of the annual ball given by the association at the Lennox Lyceum on Wednesday evening, January 28th, 1891. Mr. Gabay says that the ball was a grand success in every particular. It was largely attended, and, socially, was a very brilliant affair. There were a number of prominent people present from other places. Cappa's Seventh Regiment Orchestra discoursed the latest music, with C. A. Cappa as director. The Grand March was led by President Henry G. Gabay and Mrs. J. A. Rossman, followed by Mr John Byrns, chairman of the Reception Committee, and wife. Then came Messrs. and Mesdames Geo. D Scott, W. R. Bracken, J. N. Knight, W. P. Austin, John Deering, James Gilroy, C. H. Kranichfelt, John Renehan, John Spence, Wm. Vail, Wm. Young, John Yule, and others. The costumes of the ladies were elegant in the extreme. Some of those who attended the ball were Mr. Morrison, from Syracuse; Messrs. Fitzpatrick and Lewis, from Brooklyn; Aldermen Ryder, Roche and McGinnis, New York. The journeymen were also represented by President Lee, Messrs. McCabe and Maples. Prominent among the dealers were Messrs. Coleman and McKennedy, of the J. L. Mott Iron Works; Messrs. McShane and Murray, of the Henry McShane Co.; Messrs. Sayer, Harrison and Smith, of F. Adee & Co., and Mr. Deering, of Ronalds & Co.

BALL OF NEW YORK JOURNEYMEN PLUMBERS.

The following letter from the brilliant pen of Matthew F. Donohue, secretary of L. U. No. 2, U. A., recently appeared in the *American Plumber:*

The ball occured Jan. 15th, in Central Turn Verein Hall in New York City, and Mr. Donohue says that he can safely say that no more brilliant assemblage was ever held within its walls. As far as magnificence and notability is concerned, it eclipsed all previous balls held by the journeymen of this city. The music was furnished by Professor Baynes, 69th Regiment band, which possesses a national reputation, and was excellently rendered. The grand march was led by Floor-Manager Daniel McBried and his young and pretty wife, followed and ably assisted by Assistant Floor-Manager Patrick McGuire and President John A. Lee and wife, Vice-President William C. Jardine and sister, Rec. Sec. Matt T. Donohue and wife, Inside Sentry James Mooney and wife, James J. Morris and wife, John McKenna and wife, and others too numerous to mention, making a grand total of 176 couples and presenting as pretty a sight as mortal eye could wish to see. The pretty faces and costumes of the ladies and the neat dress of the gentlemen presented a perfect panorama of grace and beauty as they moved through the difficult intricacies of the march. Among the prominent master plumbers present were

Mr. John Byrnes, of Grand street, Mr. John H. Vantine, of 125th street, Mr. Kirchoff, of Kirchoff & Brown, Mr. T. J. Byrnes, of Byrnes & Tucker, Mr. J. N. Knight, of 7th avenue, J. A. Rossman and others; also Mr. Thomas Hudson, ex-president of the Master Plumbers' Association of Brooklyn, was at the head of a delegation from the joint conference committee of master and journeymen plumbers from that city, among whom was James J. Doody, president of Local Union No. 1; John Todd, ex-delegate; Bro. Campbell, recording secretary of Local Union No. 1; P. H. Gleason, Nat. Treas. U. A.; and many other well-known bosses and journeymen. At the reception given the invited guests, able and instructive addresses were made by Mr. Byrnes of the master plumbers of New York; Mr. Hudson, of master plumbers of Brooklyn; Mr. Doody of journeymen plumbers of Brooklyn, and President Lee of this local union. A voting contest also took place for a gold-headed cane for the most popular member of the association and was won by John McKenna, who received 539 votes, the next highest competitor, John McGill, receiving 534 votes, the next highest being President John A. Lee and your humble servant.

AMONG THE PLUMBERS.

Shehan & Grovark, of New Haven, Conn., will fit up the elegant new block of brick tenements to be erected on Humphrey street by James T. Mullen.

Speaking of the St. Louis master plumbers, the *Building Trades Journal* says: The "Association of Master Plumbers of the City of St. Louis" is the most compactly organized trade association of the city. Every registered plumber is in it. It absolutely controls the plumbing business of the city. No man in the plumbing business can afford to stay out of it. But it is not used to oppress the patrons of the plumbing business, or to hamper enterprising firms seeking trade. Its policy is liberal and business-like. Its affairs are well conducted. The supply-houses all respect and cater to the association on that account.

If any house-owner wants to know the value of good plumbing and the far-reaching effects of the plumbers' movement for the advancement of plumbing, let him try to rent two houses—one properly plumbed and the other defective in this regard. He will soon see that the money expended for good work and good material is the most profitable investment he can make. Modern sanitary plumbing has already added greatly to the value of property and decreased in a greater ratio the cost of sickness.

The plumbers of Norfolk, Va., will in the future be required to pass an examination as to their competency to do plumbing work. The examining board will consist of a master plumber, the city plumbing inspector, and the register of the water board. The plumbing inspector is James W. Guy, and the register of the water board is John P. Todd; and the examining board will be ready to proceed to business as soon as the master plumbers select their representative. It has been decided by the board of street, sewerage and drain commissioners of the city to enforce an old ordinance governing plumbing, house-drainage and the ventilation of house-sewers, which has been a dead letter. This regulation is as follows: "No plumber or any other person shall be allowed to uncover the public sewer or any of its branches for any purpose, or to make connections therewith, unless and except by consent of the board of street, sewer and drain commissioners or their duly authorized agents, whose duty it shall be to insure a full compliance with these regulations in relation to house connections; and no such connections shall be made except by skilled and competent mechanics, duly licensed to do such work by the board of street, sewer and drain commissioners."

B. A. Ward and David Napier have started a plumbing business at Michigan City, Ind., and are hustling some of the older firms at a lively rate.

The death of the State Vice-President of Oregon, J. J. Owens, recently occurred at his home on the Pacific slope.

The old war horse, James Cameron, still leads the Master Plumbers of Davenport, Iowa. He was recently elected President of the association.

The Bridgeport (Conn.) master plumbers met at the Atlantic hotel on the 22nd of January for their annual banquet. Nearly two score members of the craft sat down to one of the finest spreads ever enjoyed in Bridgeport. After the repast cigars were passed around and the usual speech-making began with President Goodsell as toast master. The following gentlemen responded in their usual and characteristic way: Col. William H. Stevenson, John N Near, E Parmly, Patrick Coughlin, L. M. Hopkins, E. G. Burnham, L H. Mills, Alfred Hopkins, Henry Middlebrook, John Kearns and Robert Morgan. The music for the occasion was furnished by John Kearns. The newly elected officers are Zalmon Goodsell, President; James Cook and H. B. Middlebrook, Vice-Presidents; Thomas Logan, Treasurer; C. S. Eames, Recording Secretary; Alfred Hopkins, Corresponding Secretary; George E. Schofield, Financial Secretary; John Kearns, John Schwing, Gerhard Drouve, Lucius H. Mills, M. R. Leavenworth and Jeremiah Reilly, Trustees

In compliance with the call of National President Robert Griffith the Executive Committee of the National Association of Master Plumbers met at the Gibson House in Cincinnati, on January 26th, 1891. The only three members of the committee absent were Joseph R. Alcock and J. J. Hamblin of Chicago and W. F. McCarthy of Denver, Colorado. Reports were received from the state vice presidents which showed a healthy condition of the organizations throughout the country. President Griffith gave a resume of his successful work in organizing the plumbers throughout the South and West. While in the city the Executive Committee paid a visit to the Ohio Mechanics' Institute and attended the regular meeting of the Cincinnati Master Plumbers Association. This meeting was very largely attended by the local members of the craft in honor of the visiting members. Addresses were made by the following members of the National Executive Committee: President Robert Griffith, Ex-President E. J. Hannan, Vice-President J. A. McDonald, W. G. Reed, Mortimer J. Lyons, N. B. Hussey and L. B. Cross.

The seven plumbing firms at St. Joseph, Mo., have received an addition to their number in the firm of Van Deventer & Mooney. The new firm will do a general plumbing and gas-fitting business.

Charles Walter was fined $110 and costs by Justice Wallace his week for not notifying the Commissioner of Health that the plumbing in a certain building was ready for inspection.

Peter Gow, an old and prosperous master plumber, who has been doing business for many years at 858 N. Ashland avenue, has purchased the property at 858 N. Rockwell street where he has fitted up an elegant shop and will carry on his business in the future. We rejoice at Mr. Gow's success, and sincerely hope that his business will rapidly multiply with his increased facilities for first class plumbing work.

The amended sections of the city ordinance of Milwaukee, relating to plumbing, etc., have been pronounced illegal, and the friends of the ordinance are now engaged in securing state legislation that will cover the desired improvements.

John Schoer has succeeded the firm of Mueller & Schoer, at St. Louis, Mo.

Louis H. Stroh and Otto Huber have formed a partnership to carry on the plumbing business in New York City. Their address will be 541 West Fiftieth street.

The Scoville Plumbing Company, of Des Moines, Ia., is composed of W. P. Scoville, F. A. Percival, M. J. Scoville, H. Regelman, James M. Latimer, Tyler Scoville and Lee A. Walker.

Pittsburg plumbers: W. Holste will fit up a house on Federal street and three on Fifth avenue; F. P. Blythe will do the plumbing work in two houses on Webster avenue; J. C. Hare & Co. will plumb a house on Butler street; C. W. King has a contract for a house on Hay street; A. McFadden & Co. will fit up a building on Fifth avenue, and John Cowley a house on Negley avenue.

John Hilderbrandt has joined the master plumbers of Logans port, Ind., and has opened a shop on Pearl street.

The officers for the ensuing year of the Boston Master Plumbers' Association will be: President, T. J. Tute; first vice-president, Henry W. Tombs; second vice-president, D. A. Horgan; third vice-president, W. H. French; recording secretary, David Smith; corresponding secretary, W. N. McKenna; financial secretary, Geo. Forbes; treasurer, Wm. Lumb.

F. P. Tuite, of Detroit, paid our office a visit last week and

showed us a sample of his patented plumbers' torch. Mr. Tuite has made a great success of his various patents, and his plumbers' torch is proving to be of inestimable value to the craft.

Louis Kettleson is one of the enterprising plumbers of Sioux City, Iowa.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago: Twentieth and State streets, store and flat building; cost, $50,000. Beman & Parmentier, architects. Armour street, near Archer avenue, double flat building; cost, $11,000. Rush and Ohio streets, large building will be remodeled; John Addison, architect. The same architect has plans for a two-story brick and stone building to be built on Belden avenue. North Western avenue, store and flat building; cost, $25,000. C. Thisslen, architect. Twenty-sixth street near West Fortieth street, apartment building; cost, $60,000. Crowen & Richards, architects. Laflin street, near Congress, three-story appartment house; Lamson & Newman, architects. Laflin and Eleventh streets, National Turnverein building will be erected. August Moritzen, architect. 643-647 South Jefferson street, five-story factory; cost, $12,000. May street, near Ohio street, four-story flat building; cost, $12,000. Hoyne avenue, near Division street, two flat buildings; cost $13,000. Temple street, two three-story flat buildings; cost, $16,000. Charles H. McAfee, architect. The same architect has plans for a five-story factory to be built on West Van Buren street; cost, $50,000. West Monroe street four-story flat building. Oliver W. Marble, architect. South Park avenue and Thirty-fifth street, residence; cost, $15,000. Same architect. Grand boulevard and Forty-third street, residence; same architect.——Fairfield, Ia.: Architects H. C. Koch & Co., Milwaukee, Wis., have prepared plans for a court house to be erected at Fairfield for the county of Jefferson. To be three-stories and cost $60,000.——Cherokee, Ia.: Architects Kramer & Zoll, Findlay, O., have prepared plans for a court house for the county commissioners at Cherokee, Ia. To be three stories high. Cost, $80,000.——Kearney, Neb.: J. S. Harrington will, the coming spring, erect a bank, store and office building, six stories high, and to cost $100,000; the architects, W. Z. Foster and W. Pell Pullis, are now completing the working drawings.——New York City: Columbus avenue and 88th street, five brick and stone flats; cost, $150,000. F. A. Minuth, architect. 120-122 East Fourteenth street, six-story store building. Alfred Zucker, architect. 59 Madison street, two-story club house; cost, $20,000. J. S. O'Meara, architect. 83rd street near Ninth avenue, five-story brown stone flat; cost, $22,500. J. W. Cole, architect. 25 Leroy street, five-story tenement; cost, $20,000. Same architect. Cherry street, four five-story brick and stone tenements; cost, $70,000. G. F. Pelham, architect. 88th street near Amsterdam avenue, three three-story brick and stone dwellings, G. H. Anderson, architect. 38 and 40 Henry street, three-story brick synagogue; cost, $58,000. Flemer & Roehler, architects. 192 Spring street, five-story brick store; cost, $20,000. Kurtzer and Rohl, architects. Grand boulevard and 79th street, brick church; cost, $100,000. George Keister, architect. Twenty-seventh street near Ninth avenue three five-story brick flats; cost, $66,000. R. R. Davis, architect. 75th street, four four-story brick dwellings; cost, $80,000. G. A. Schellenger, architect. Cypress avenue five-story brick factory; cost, $30,000. Walgrove & Israels, architects. Broadway between 36th and 37th streets, brick flat addition; cost, $25,000. L. L. Todd, architect. New Kirk street north of Master street, sixty-eight dwellings will be erected. W. T. B. Roberts, owner.——Brooklyn, N. Y.: Degraw street near Van Brunt street, two five-story brick flats; cost, $28,000. Jno. L. Young, architect. Macon street near Ralph avenue, five two-story brick and brown stone dwellings; cost, $20,000. N. H. Raymond, architect. Humboldt and Hurbert streets, three-story brick station house; cost, $41,500. Geo. Ingram, architect. Seventh avenue, six four-story and two five-story brick stores and flats, cost, $108,000. John J. Deery, architect.——Lowell, Mass.: Plans for the new post office are nearly ready to be figured; probable cost, $200,000.—— Holyoke, Mass.: The following buildings are projected: A $20,000 church for the First Congregational Society. A $50,000 church for the French Catholic Society. High street, $20,000 brick block; owner G. C. Finsell. The Y. M. C. A. building will be commenced soon, nearly $60,000 having been raised; architects, Fuller & Wheeler, of Albany.——Springfield, Mass.: North Main street a four-story brick block, for stores and tenements; cost, about $40,000; architect, Jason Perkins.——Richfield Park, New Jersey: G. H. Anderson is drawing plans for six two-story and attic frame cottages, to be erected by himself and Mrs. L. M. Butler, at a cost of $18,000.——Ridgewood, New Jersey: W. E. Stone, of New York, is at work on plans for interior and exterior alterations to be made by Dr. J. J. Sucket in his house at this place. The improvements are to cost $20,000.——Philadelphia, Pa.: Cantrell street West of Third, eighteen dwellings will be erected. W. J. Ross, owner. C. C. Moore will build 250 houses. Some of them will occupy a tract of land at 46th street and Woodland avenue, several rows will be built at Frankford and Allegheny avenues. Front street and Lehigh avenue, row of large dwellings will be erected. John J. Cassidy will build fifty houses in the First ward. Twenty-eighth ward, the Midvale Steel Works will erect a large building.——Washington, D. C.: Architect W. M. Poindexter is preparing plans for an academy building for the Randolph-Macon College at Front Royal, Va., to be three stories and basement, of red brick. It will cost nearly $100,000. The United Service Club will erect at the northeast corner of Connecticut avenne and I street a large club building. The building when completed will cost about $70,000. The designs and plans were made by architect Harvey L. Page. On Seventh street, between E and F streets, opposite the Post Office Department, M. G. Emery, president of the Second National Bank, intends building a structure for mercantile purposes. It will be five stories and cost about $17,000. Architect T. F. Schneider has made plans for a residence that Dr. J. O. Stanton will build at the southeast corner of Sixteenth and O streets. It will be four stories. Architect Leon E. Dessez is engaged on plans for a residence that W. I. Brooke will have built at the corner of Sixteenth and Swann streets. It will be three stories and basement. Architect J. G. Mayers has plans for a dwelling for Jno. C. Parker. It will be located on P street, near the corner of Sixth street, northwest, and will be a double building and three stories.——Bardstown, Ky.: Architects McDonald Brothers, Louisville, Ky., are preparing plans for a new court house for Nelson County. It is to be two stories high, built of brick, with stone foundations. Cost, $29,000.——Atlanta, Ga.: Architects Bruce & Morgan have plans for a store building for J. M. High. To be four stories high, built of common and pressed brick, stone and terra cotta. Cost, $60,000.——West Philadelphia, Pa.: A riding school and boarding stable will be erected. Otto C. Wolf, New York, architect.——Tacoma, Wash.: A large hotel will be erected by a syndicate of Philadelphia capitalists. F. W. & W. D. Hewett, New York, architects.——Monmouth Park, N. J.: A large hotel will be erected. Charles Balderson, New York, architect.——Beverly, N. J.: A public hall will be built by Ridgeway Post, G. A. R.——Cape May Point, N. J.: A summer cottage will be erected after plans prepared by Amos J. Boyden, Philadelphia.——Cincinnati, O.: Architect Martin Fisher has designed a block of five two-story dwellings, to be erected at Seattle, Washington; cost, $11,000; also office building, to be located at Fort Scott, Kansas; cost, $14,000. Both are for Cincinnati parties. Architects S. Hannaford & Sons are preparing the drawings for the Odd Fellows' Temple. Architects G. & A. Brink have on the boards: a block of three three-story brick and iron stores, to be located on Central avenue, between Charles and 12th streets; cost, $12,000; a four-story pressed brick and stone flat and stores to be erected at Liberty and Western avenue; cost, $12,000; Pfeiffer & Deitz have designed a two-story stone dwelling, to be located on Clifton Heights; cost, $12,000.——Grand Rapids, Mich.: Mrs. John Goldsmith expects to build this year a block on east side Ottawa, just north of City Hall.——Iron Mountain, Mich.: The Iron Mountain Brewing Company is erecting a brewery which will cost $75,000; plans were prepared by Frank Ruschaupt, of Milwaukee, Wis.——Syracuse, N. Y.: Architects Buell & Taber have plans for a mercantile building for R. C. McClure, South Clinton street. To be five-story, brick, with stone foundations and trimmings; cost, $20,000.——St. Louis, Mo.: Montgomery street, near Elliott

avenue, a three-story brick school building; cost, $14,000. St. Louis Public Schools, owner. Corner Delmar and Taylor avenues, a two-story brick store and dwelling; cost, $12,000. F. Spengen, owner. Corner Dodier and Parnell streets, a four-story brick building; cost, $17,000. St. Louis Brewing Co., owner.——Meriden, Conn.: B. Hammett Seabury, of Springfield, has prepared the plans for the Universalist Society's new building.

HEATING AND LIGHTING.

Richmond, Va.: At a recent joint meeting of the Finance and Electric Light Committees it was decided to recommend to the city council that $75,000 be appropriated for a municipal electric light plant.——Bristol, Tenn.: The organization of a company with $100,000 capital stock for erecting an electric and gas-lighting plant has been completed. A. H. Leftwich, president; T. H. Fox, secretary.——Chattanooga, Tenn.: The different railways entering the city will erect a joint electric light plant. C. H. Hudson, of Knoxville, can give further information.——Culberson, N. C.: A new electric light plant will be erected. Address the Molta Consolidated Marble, Iron and Talc Company.——Danville, Va.: The mayor can give information concerning the new electric light plant.——Edinburg, Ill.: A new electric light plant will be erected. Address the Edinburg Coal and Iron Co.——Louisville, Ky.: H. Knirihm can give information concerning the new electric light plant.——Springfield, Ill.: J. McCreery may be addressed for information concerning an electric light plant.

SEWERAGE NOTES.

Newton, Mass.: The report of the sewerage committee has been adopted, and the committee anthorized to advertise for bids for sewer pipe. The appropriation for the work is $400,000.——Providence, R. I.: It is proposed to issue bonds for $2,000,000 for sewers.——Norwich, N. Y.: The appointment of a sewer commission to lay out a complete system of sewerage is contemplated. J. P. Allds is city engineer.——Bryn Mawr, Pa.: Col. George E. Waring, Jr., is preparing plans for disposing of the sewage of the Bryn Mawr Hotel.——Wayne, Pa.: Col. Waring has charge of the construction of a system of sewage disposal by surface irrigation of lands below the town.——Baltimore, Md.: The mayor's annual message calls attention to the necessity of adopting some general system of sewerage.——Old Point Comfort, Va.: Colonel Geo. E. Waring, Jr., has been engaged to prepare plans for the sewerage of the whole reservation, including Fortress Monroe.——Goldsboro, N. C.: It is proposed to issue $50,000 in bonds for a sewerage system.——Anderson, Ind.: The city engineer, Mr. Hy. Rawle, has been authorized to consult Col. Geo. E. Waring, Jr., concerning plans for sewerage.——Saginaw, Mich.: Plans for a sewerage system for the western district have been prepared by the city engineer, Mr. R. W. Roberts; estimated cost, $50,000.——Winona, Minn.: The report made by Mr. Chester B. Davis, M. Am. Soc. C. E , of Chicago, recommends the separate system of sewerage and adoption of the Shone system. The Shone system has been recommended before, and defeated; but the council has now adopted a resolution in its favor, and has had an interview with Mr. U. H. Broughton, engineer and manager of the Shone Hydro-Pneumatic Sewerage Co.

WATER-WORKS NOTES.

Hinsdale, Ill.: The village proposes to let contracts very soon for works estimated to cost $44,000. The supply will be from an artesian well which will discharge into a 60,000 gallon reservoir. From the reservoir a 1,000,000 gallon pump will lift water to a 30,000 gallon Morgan tower. There will be 7 miles of pipe and 49 hydrants. G. C. Morgan, Chicago, engineer.——Saginaw, Mich.: Plans and estimates for a new water supply have been prepared and are now under consideration; estimated cost, $100,000. Address R. W. Roberts, city engineer.——Iowa Falls, Ia.: A proposition to construct works is under consideration.——Kendrick, Ia.: The town will build works.——Santa Ana, Cal.: The city has sold $60,000 of water bonds to M. M. Cruikshank. Plans and specifications have been made, and bids for works are desired. Address E. Tedford, city clerk.——Berryville, Va.: All bids for the construction of works have been rejected. The specifications are being revised, and new bids will be received until March 2nd. Address for particulars T. S. Thompson.——Pulaski City, Va.: The Norfolk & Western R. R. Co. will put in a new pump and boiler here. The offices of the company are at Roanoke.——Hickory, N. C.: The mayor can give information regarding works projected in the town.——Morgantown, N. C.: The Morgantown Development Co. has been incorporated to erect mills, water-works, etc.; capital $500,000.——Chester, S. C.: Address the mayor concerning water-works.——Cedartown, Ga.: Thomas McMeekin may be addressed concerning new works.——Fort Valley, Ga.: An election was held Jan. 24th for voting water-works bonds. Address for particulars Mayor J. A. Monser.——Harrodsburg, Ky.: Plans and specifications for new works are being prepared by Jas. P. Herdie, Williamsport, Pa.——Eaton, O.: Plans and specifications have been prepared and a vote will be taken in the spring upon the issuance of bonds for works, to cost about $67,000. It is proposed to drive six 6-inch wells on the west bank of Seven Mile creek, ¾ miles from the village. A 12-inch pipe to the creek would provide for emergencies. Two 750,000 gallon compound condensing duplex direct-acting pumps will force water through a 12-inch main to a stand-pipe 20x80 feet on a masonry base 50 feet high. There will be nine miles of 12 to 4-inch cast-iron pipe, 74 double 4-inch hydrants and 56 valves. John W. Hill, Cincinnati, Ohio, is engineer.——Terre Haute, Ind.: The National Filtering Company will enlarge its plant.——New Britain, Conn.: The water supply will be increased in the spring. Address the mayor for particulars.——Millerton, N. Y.: New works are contemplated.——Rochester, N. Y.: S. B. Roby advocates a water supply from Lake Ontario of 20,000,000 gallons a day, which could be increased to about 30,000,000 gallons a day by adding more pumps. The plan includes two miles of 7-foot lake tunnel, two pumping stations, each with two 20,000,000 Gaskill pumping engines and a battery of 16 5x15-foot boilers, eight miles of 4-foot cast-iron pipe, and three masonry and steel standpipes. The estimated cost is $2,000,000——New Brunswick, N. J.: Several miles of cement-lined pipe will be replaced by iron, and 150 tons of the latter will be purchased. C. H. Crammer is superintendent.——Lebanon, Pa.: At a recent meeting of the water commissioners and city committee it was decided to build a new impounding reservoir on South Mt., near the present source of supply, the reservoir to have a capacity of over 40,000.000 gallons. W. J. Burnside is city engineer and H. M. Allwein superintendent of water-works.——Turner, Me.: Water-works will soon be constructed.——Groveton, N. H.: The Groveton Water Company has been incorporated; capital stock, $6,000.——Manchester, N. H.: An increased water supply is being discussed Address for particulars C. K Walker, superintendent.——Salem, N. H.: The Salem Water-Works Company has been incorporated.——Providence, R. I.: The General Assembly will be asked for authority to issue $500,000 water-works extension bonds.——East Hartford, Conn.: The East Hartford Water Company will construct works the coming season. The company has a capital stock of $100,000. E. J. McKnight is president of company.

BIDS AND CONTRACTS.

Providence, R. I.: Sealed proposals will be received until 12 o'clock M., Thursday, February 12, 1891, for building the outlet portion of Section 1, and for building Section 2 of the "Improved Sewerage System" of the city of Providence, in accordance with the form of contract and specification to be furnished by the Commissioner. John A. Coleman, Commissioner of Public Works.——Boston, Mass.: Sealed bids for building Sections E, F and G of the Metropolitan Sewerage System in Brighton, Newton and Watertown, in accordance with the form of contract and specifications to be furnished by the Board of Metropolitan Sewerage Commissioners, will be received by said board at its office, 93 Lincoln street, Boston, Mass., until 12 o'clock M. of Saturday, Feb. 14, 1891. Hosea Kingman, Tilly Haynes, Robert T. Davis, Board of Metropolitan Sewerage Commissioners of Massachusetts. Howard A. Carson, Chief Engineer.——East Orland, Me.: Sealed proposals will be received until 12 o'clock, noon, of February 16, 1891, at which time they will be opened in the presence of attending bidders for the construction of two buildings on the property of the United States Fish Commission at East Orland, Me. Specifica-

tions, plans, blank proposals and full information will be furnished on application to the postmasters at Bangor, Bucksport and Ellsworth, Me., respectively. Marshall McDonald, Commissioner.——Eastport, Me.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 12th day of February, 1891, for all the labor and materials required for the stone and brick masonry of the superstructure, also for the iron floor, ceiling and roof construction, floor arches, etc., for the United States Custom House and Post Office building at Eastport, Me., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent at Eastport, Me. Jas. H. Windrim, Supervising Architect.——Charlotte, N. C.: Sealed proposals will be received at the office of the Supervising Architect Treasury Department, Washington, D. C., until 2 o'clock P. M., on the 11th day of February, 1891, for all the labor and materials required for the approaches to the United States court-house, post-office, etc., building at Charlotte, N. C., in accordance with the drawings and specifications, copies of which may be had on application at this office or the office of the superintendent at Charlotte, N. C. Jas. H. Windrim, Supervising Architect.——Washington, D. C.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P.M. on the 13th day of February, 1891, for all the labor and materials required for the erection and completion (except elevator heating apparatus and plumbing of the building for the extension of the United States Bureau of Engraving and Printing at Washington, D. C., in accordance with the drawings and specificatoins, copies of which may be had on application at this office. Jas. H. Windrim, Supervising Architect.——Santa Ana, Cal.: Sealed proposals will be received by the City Clerk of the city of Santa Ana, for the construction of a complete system of water-works. The said system to be a combination of the stand-pipe, with the Holly or direct pressure system, according to plans and specifications now on file in the city clerk's office in said city. Bids will be received up to 5 o'clock P. M. of March 16th, 1891, the work to be completed within six months from date of the contract. The capacity of said water-works shall not be less than 1,500,000 gallons in twenty-four hours. The distributive system will require about 30,000 lineal feet of 4-inch pipe more or less. Sixty double fire hydrants, twenty-two gates and 7,000 pounds special fittings. The stand-pipe will be 16 feet in diameter, and 140 feet high. Power house, 36x42 feet. Reservoir, 78x98 feet, inside measure; depth, 10 feet; walls, concrete. Ed. Tedford, City Clerk.

PLUMBERS FOR SANITARY INSPECTORS.

We are pleased to note that the press of this city is in harmony with The Sanitary News concerning the appointment of sanitary inspectors, as is evidenced by the following from the *Globe*, in addition to that already given from other papers:

The journeymen plumbers, the contractors of plumbing work and the manufacturers and dealers in plumber's supplies have united to ask the city council of Chicago for the legal regulation of all plumbing in buildings and for plumbing inspectors as sanitary policemen. Mayor Cregier appointed a master plumber to the responsible position as chief inspector of factories and tenements and selected twelve plumbers to the office of factory and tenement inspectors; but there is no special ordinance legalizing any standard of house-plumbing and designating unsanitary plumbing as a common nuisance, which could be abated by legal process. Joseph Gruenhut placed the real condition of the plumbers' status before the meetings of the journeymen plumbers and the plumbing contractors, and urged them to persuade the state legislature and the city council to institute sanitary plumbing by law and by ordinance and to ask for an appropriation for a board of plumbing examiners and about fifteen practical plumbers for the inspection of old and new buildings.

If the city council should plead its inability to appropriate a sufficient sum for skilled plumbers, the association of the plumbers should make up the necessary amount for a fair start. There are about 150,000 buildings in Chicago, and 15,000 new buildings or renovations will be the average for many years to come. Sound public policy requires that the guardians of sanitary arrangements of our buildings should not be mere spoilshunters, greedy for jobs.

A committee is now deliberating on the contents of an appeal to the citizens and taxpayers, and a proper ordinance will be submitted to the city council at the earliest opportunity. The appropriation bill will be discussed by the city council next month, and the health department will ask for a large sum for the daily scavenger service; but the estimates do not contain an appropriation for practical plumbers as inspectors of places of habitation and employment. Therefore an effort must be made to place the merits of the case before the proper authorities.

In 1879 and 1880 the city council passed the factory ordinances, and in 1881 the tenement and lodging house ordinances which are now in force, and in 1889 Alderman Connor succeeded in procuring the appointment of ten plumbers as factory and tenement inspectors. But at the present time there is no ordinance providing for the appointment of plumbers, and therefore the trade unions are appealed to. This is not simply an object of charity to a dozen plumbers out of work, but rather a matter of justice to taxpayers, who ought to get the best service by plumbers who have proven their efficiency in their trade.

Mayor Cregier and Health Commissioner Dr. Wickersham favor the request of the organized plumbers, but it depends on the city council whether or not there shall be a standard of sanitary plumbing enforced by practical plumbing inspectors in Chicago.

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LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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IN COMPLIANCE with a respectable demand, the next issue of THE SANITARY NEWS will contain, in some elaboration, the principal objections raised against the drainage system as at present projected. We give this as a matter of information on which everyone can base whatever estimate or opinion as to him seems best.

WE ARE informed that Chief Plumbing Inspector Robinson has inspected the sanitary condition of the White House at Washington, D. C., and that in his report he states that with the present advanced state of house sanitation and the art of plumbing, no person who had the means of making the proper repairs would submit to the unsanitary conditions now existing in the White House. If the department that has control of the government buildings were to call off politicians and party servants and secure good reputable workmen to do the plumbing work, there would be more sanitation and less scandal. The plumbing in the government buildings at Washington have furnished reporters many items of news and long articles with scare heads, and it is all based on "jobs." Let us have some real, genuine plumbing by real, genuine plumbers, for a change and good health.

FROM a Detroit paper we clip the following from Dr. H. W. Longyear: "While the spirit is moving in divers and sundry ways in the direction of public improvements, I have a suggestion to offer: One of the most necessary things for the welfare of the people of Detroit, and one whose expense would be infinitessimal compared to the sums that are proposed to be expended, is a proper scientific supervision of house plumbing and drainage. The office of sanitary engineer should be created, to supervise and control the construction of the plumbing and drainage of all new structures. In my opinion bad plumbing is the cause of more sickness and death than any other one factor. This has been clearly demonstrated in my practice many times. Most of the large cities of the country have such an officer, and his position in such cities is universally recognized by the medical fraternity as of the most vital importance. There is more sanitary plumbing done in Detroit now than when the older residences were built, in which the plumbing was, and still is, of the worst possible character; but even the highest class of plumbing that is being done at the present time should be required to pass the inspection of a sanitary engineer." We have had several very vigorous complaints regarding the sanitary condition of Detroit, and some pointed criticisms concerning the plumbing, especially that done in the earlier days. As a remedy for this Dr. Longyear recommends the appointment of a sanitary engineer to supervise and control the construction of the plumbing and drainage of all new structures. We do not know just what the Dr. means by a "sanitary engineer," but we do know, or at least most firmly believe, that if the master plumbers of Detroit were given a chance, they would soon make good plumbing the rule and bad plumbing a rare exception. If that city would follow the example set by Chicago and place a good practical and intelligent plumber at the head of a department directed toward the inspection of plumbing in both new structures and old buildings, the evils now complained of would soon disappear. The most rigid inspection and control of plumbing in the construction of new buildings will not suffice. The best of plumbing is often rendered defective through the recklessness, ignorance and abuse of the occupants of dwellings, and inspection and repair are continual necessities. Everything needs repair in time. Cities grow, buildings are remodled, rebuilt and repaired, and plumbing inspection to be adequate must keep pace with the work of improvement. The proper persons to place in charge of this most important work are the ones who understand it, those whose business has made them acquainted with every detail of the scientific and mechanical construction of plumbing, and if the plumber is not the man thus fitted, who is? Why the mistake is made that some one not a plumber knows more about plumbing than a plumber does, is the most difficult thing on earth to understand. How apparently sensible men get it into their heads that a plumber is not qualified to judge the character of plumbing is a mystery too profound to be solved by the means at hand. The man who would displace a plumber as an inspector of plumbing and substitute a carpenter, a blacksmith or other person, would not surprise us by hitching up a jack rabbit instead of a horse to his buggy.

ADVICE FOR THE HOUSEWIFE.

Here is a bit of advice given the housewife by *Harper's Bazar:*

"To find the water pipes leaking, frozen, or perhaps burst, is no rare occurrence during the winter in the modern much-plumbed houses. Nothing more thoroughly demoralizes the domestic machinery than such unlucky happenings. Floors are wet, ceilings leak, the water is shut off, and the whole household is at a standstill, waiting for that vexatious will-'o-the-wisp, the plumber. Whenever the leak is visible, the housewife can cure the ill herself, at least temporarily. Shut off the water first, and then spread some white lead on a cloth, like a plaster. Tie this firmly over the leak, and the plaster will soon harden, for the water cannot work its way out or prevent the plaster's adhering. Unless the plumber will make thorough repairs when he does come, the

hard plaster is more permanent than any puttied joint or weak solder. Let a pound of white lead stand a day or two until a skin has formed over it, and then cover it with water. It will be soft and ready for use at any time, and the housewife can "snap her fingers at the plumber's ways," to paraphrase Sir Joseph Porter, as best suits a frosty morning. Strips of rubber cut from old rubber shoes and bound tightly over the leaks in hot water pipes will close the holes and stop the dripping flood.

"When the water freezes in the traps of the bath room or the kitchen sink, a quart of common salt thrown into them will thaw them out more rapidly than hot water. A lighted lamp placed under a frozen water pipe is more rapid and convenient in its work than pouring on hot water. A lamp, the flame partly lowered, placed under an exposed bend or length of pipe which is liable to freeze is a simple preventive of trouble in bitter weather."

We have not been called on for any advice in this matter, but as there is no charge we will volunteer this to the said housewife: Don't subscribe for or read the *Bazar*. Get an almanack. We do not say the almanack will be as good as the *Bazar*, but it will be cheaper. Now, if the *Bazar* should read the above he would think "what a fool that man is." That is right. He ought to think it, for that is just what "that man" thinks of the *Bazar* when he advises the housewife to attempt her own plumbing repairs instead of sending for a plumber. And if the *Bazar* does not know that many pipes are burst by "thawing them out" with torch, lamp or shovel of coals, it ought to. In the hands of inexperienced persons this is about as successful a way of bursting pipes as is known. But, to make a long story short, the best advice to give a housewife regarding plumbing repairs is to go straightway and get a good plumber to do the work.

Now, we want to give that same housewife a little advice: "If your child should break its arm, go at once and get a surgeon to reduce the fractured limb. Do not attempt to "set" it or plaster or tie it up yourself, for you do not know anything about it and cannot do it. Now, you will heed this advice. You would have done just this thing if no such advice had been given. It is right that you should. It is sensible. But why can you not be as sensible in the other case, and, when an arm or leg or any part of your plumbing system gets broken or out of order, go and get a plumber to repair it? "But," says the housewife, "in the former case the welfare, happiness and usefulness of my son are involved." True, they are; but in the latter case the health and life of your entire family are involved. It is right to provide for the welfare of your son, but it may become many multiples of that right for you to be as careful and watchful regarding the welfare of your whole family.

THE AMENDED ORDINANCE.

An amendment to the city ordinance regarding sanitary inspectors, which has been fully set forth in these columns, will probably be presented to the city council on Monday night next. There is little need of saying more on this subject than has been said. To all reasonable minds the justice, propriety and importance of the matter are surely apparent. That the great growth of Chicago and its increased sanitary needs have made the increase of our sanitary police with the addition of plumbing inspectors, a necessity, there is no possible room for the shadow of a doubt. That this department of the public service appeals to the highest interest and greatest welfare of the people, there can be no question. There is not an individual in the city, who is informed at all on this matter, who would not heartily sanction the consummation of the proposed legislation; and if there be ignorance regarding the matter, that in itself is an irrefutable argument in favor of adequate means for the strict enforcement of proper sanitary measures.

This is not a matter of politics or party policy. If it were The Sanitary News would have nothing to do with it. It is a proposition to supply the most important needs of a great city by means which experience has proved to be the best. The offered amendments do not propose an experiment or suggest the vision of a theorist. They present only what practical experience has taught to be the most efficient, and what a knowledge of the existing conditions proves to be an absolute necessity. There can be nothing more than this urged in the support of any public service, and, this existing, as it certainly does, there can be no reasonable objection offered to it. No individual who values health can oppose these amendments, and every business man who knows the value of a healthful city, the value of a healthy business as well as that of a healthy body, must approve it. It may be urged that this addition to the Health Department will cost something. True, it will. But every public service and personal necessity we have cost something, and as this objection is common to all, it cannot apply against any one in particular. It costs something to provide clothes, but it would cost more to do without them. It costs something to provide warmth and light, but it would cost more to do without them. It costs something to provide waterworks and a sewerage system, but it would cost more to do without them. It costs something to provide for the health of a people, but it would cost more to be sick.

From a business or pecuniary point of view it pays to provide the best health conditions possible. Whatever expenditure is necessary to procure an adequate and efficient public health service is as absolutely needful as are the provisions for the collection of taxes or the means of education. On the health of a city depend its energy and productive power which invite new enterprises and encourage investments. Defective sewerage, insufficient water supply, filthy streets and illy drained buildings can detract more from a city's progress than all other agencies can add. These things do not need proof. They are self-evident. The means of supplying the best health conditions may admit of discussion, but the ones proposed are the only ones in use, and the ones which the experience of all cities has proved to be the best. The question now submitted to the council is: Will the highest interests of the city be served, and will the best means of serving that interest be employed?

The members of the city council are chosen not only to legislate in accordance with public sentiment and to provide laws which the people demand to serve their best interests, but to discover those interests and to provide the best means of promoting them. They are chosen with reference to their fitness to determine the needs of the people and provide for them. That is their highest duty toward the citizens, and that is what they are chosen to do. The health of a people is certainly one of their greatest interests, and a legislator can perform no greater service or discharge a higher duty than to provide the most efficient means of securing the best possible health conditions. Our greatest sanitarians and health officers declare that efficient sanitation depends more on proper inspection than on any other one thing. It is the basis for all sanitation and all hygienic remedies. The proper application of a remedy depends on a perfect knowledge of the evil to be remedied. This can be obtained only by inspection, and the more thorough the inspection the more efficient the remedy. Viewed in every light possible we see no reasonable objections that can be urged against the proposed amendments, and we believe the council will provide means adequate to the importance of the demands.

NOTES AND NEWS.

Porous terra cotta is said to be the best fire-resisting substance known.

It has recently been found that certain fungoid growths have the power of removing gold from water containing it in suspension.

A new asphalt for streets and house-roofs, manufactured from Caucasian naptha, has, says the *Electrician*, been placed upon the market.

It is proposed by an American engineer to remove Incrustation from boiler-tubes by temporarily enlarging the tubes by means of a tool having opposite projecting rolls traveling in a spiral.

To tar iron pipes, coat the outside with coal-tar, and build a light fire of shavings in the inside. This makes the coating solid. Too much heat melts the tar so that it runs off the pipe,

By the application of chloride of antimony a beautiful violet color is imparted to brass work. The brass should be first made perfectly clean, and heated until water will steam off it without hissing.

Leaks in cisterns can be repaired by applying to the seams a mixture of four parts of linseed oil, boiled with litharge, and eight

parts of melted glue, mixed well together. In about two days after application it will be found to have set so hard that water can again be admitted with safety.

A movement has been started in Germany to present a petition with an enormous number of signatures to the Reichstag, in favor of establishing sanitariums for the cure of poor consumptive patients.

Small-pox, formerly very prevalent in Japan, has steadily diminished for the past ten years in proportion to the introduction of vaccination.

In forty years cholera has destroyed 343,953 lives in Prussia; but 90,000 a year, on an average, die from consumption alone.

Since 1882, Brussels has had a central vaccine institute for the production of pure animal lymph. Through the whole year, from week to week, new calves are inoculated, and the virus is sent to the physicians of the whole country, free of charge.

Brass which has been rendered hard by compression may be tempered the same as steel. To do this, a piece of polished steel is placed on the article to be tempered, and heat is applied so as to affect the steel and brass equally. The temper of the brass will be indicated by the color of the steel.

An ordinance has been passed in Indiana which compels all railroad companies to put storm-doors on all railroad coaches and street cars for the carriage of passengers, to keep the temperature from 68 to 70 in the cars, and to furnish spittoons partly filled with a solution of bichloride of mercury, for the use of persons suffering from chronic cough and expectoration.

In Brussels, Belgium, the municipality not only oversees all matters of construction from artistic and sanitary standpoints, but pays large premiums from time to time to the persons erecting structures with exceptionally fine facades. As a result, Brussels contains some of the handsomest stretches of street architecture in the world.

To prevent the paint on iron or wood from scaling off when exposed to the weather, first thoroughly wash the parts to be painted and then brush over the surface with hot linseed oil. By following this method, especially with iron articles, no scaling of the paint will occur. In cases where the articles to be painted are small and can be readily heated, it is better to heat them and plunge them into the oil. The thin liquid oil when hot enters into the pores of the metal, absorbs the moisture, and the paint then applied so firmly adheres that frost, rain or air cannot effect a separation.

The following easy method is recommended by G. Loof (*Pharm-Centralhalle*): Dissolve a few centigrams of sodium salicylate in 5 c. c. of water in a test-tube, and add 10 c. c. of colorless sulphuric acid by pouring it slowly down the inside of the tube, so that it will form a separate layer above the salicylate. Mix the two fluids by turning the tube around, without shaking. The compound will assume a color varying, according to the greater or less quantity of nitric acid present, from deep red to pale yellow, which will remain unaltered for several days. Water containing one part of nitric acid in 5,000 will turn red; one to 10,000, yellowish red; one to 20,000, reddish yellow; one to 50,000, yellowish; one to 100,000, a paler yellow. A deep coloration showing large amounts of acid indicates that one-half, three-quarters, etc, of distilled water should be added. To estimate a smaller proportion than one to 100,000, evaporate one liter of the water to 100 c. c., filter, and proceed as above directed, after which, when the mixture has cooled, divide the resulting figure by 10.

A very remarkable movement in the way of architectural education seems to have begun in England. One English correspondent mentioned the important decision of the Architectural Association to provide for its members a systematic course of professional instruction, and, since the decision was made, not only has great interest in the plan been shown by the younger men, but persons outside the profession have already offered liberal aid in extending the resources for instruction possessed by the association; one person sending a hundred guineas, to be used in improving the library, while another has guaranteed fifty pounds a year for three years, to be used for the general advantage of the course. More encouraging even than this is, however, the fact that the example of the association has set architects in places outside of London to thinking about the provision of local schools. The architects of Edinburgh have presented a memorial to the commissioners for the Scotch universities, stating that the association scheme would give students of architecture in London an advantage over those in other places, and praying that a course in architecture might be added to the curriculum of the University of Edinburgh. In London itself, it appears that the architectural department of King's College, which has been a long time in existence, shows, this year, unwonted life, and the course is to be revised and improved at once.

Some time ago the statement that the mixture of a small quantity of sugar with mortar greatly improved the latter considerably excited the risible of the building fraternity. The notion was regarded as too ridiculous for serious consideration. There is, however, reason to believe that the addition of saccharine matter to mortar is an extremely valuable discovery. In the first place, it enables bricklaying to be carried on in frosty weather. About two pounds of coarse brown sugar to one bushel of lime and two bushels of good sand will supply the proportions for a mortar that will resist frost admirably. It is claimed, however, that in addition to this advantage mortar with sugar mixed in it is vastly superior to mortar without it. It sets as hard as cement very soon, makes the brickwork exceedingly strong, and is quite effective when used with dry bricks. For indoor plastering also saccharated mortar sets hard quickly. Where portions of the same wall have been covered in one part with sugared and in another with unsugared mortar, the latter has ripped up directly when a nail was run over it, months after the former had become as hard as stone. Much interest is taken in this matter by Mr. Crampton, of Cranleigh, Guildford, and he reports some interesting experiments. He points out that if sugar be added to mortar that is already made, it will render it too thin. Strong sugared water dissolves lime in the same way that water dissolves sugar. It is therefore necessary to dissolve the sugar in water first, and then add the sugared water to the lime slowly and cautiously. The mortar should be as stiff as it can be used. For lime-washing, one pound of sugar to sixteen gallons of water will make it adhere splendidly. Drops of whitewash made with water so mixed, if they fall on the floor or window, or on an iron plate, cannot be washed off. Evidently sugar is not such an absurd thing to mix with lime as the practical man thought.

PUBLIC HEALTH OF CHICAGO.

The following from Chief Inspector Andrew Young in the *Herald* of the 12th inst., appeals to every individual who appreciates the promotion of the greatest public interest, and should be read with care and consideration: Whatever can cause, or help to bring pain, sickness, death, vice or crime, are matters of interest to our citizens. Epidemics are no longer considered as the vengeance of an offended deity, but take their place as the offspring of governmental and municipal indifference to natural laws. To what extent the prevention of disease and the prolongation of life may be carried may be judged by the results attained and by the decrease of the death rate in different localities where actual sanitary work has been attained.

Thousands of lives are lost every year that might be saved, and tens of thousands of cases of sickness occur which might have been prevented. A vast amount of unnecessarily impaired health and physical debility exist among those not confined by sickness. These preventable evils require an enormous expenditure of money and impose upon the community calamities, pecuniary, social, mental, physical and moral, which may be avoided. That means exist for their mitigation or removal, and that measures for their prevention will effect more than remedies for the cure of the disease, must be admitted by every one familiar with what has been accomplished in other localities.

The power and wealth of a community depend upon the capital accumulated and upon the proportion which its effective or productive inhabitants bear to those who are non-productive. In the United States, according to Dr. Jarvis, about one-half are sustaining and one-half dependent. Accepting this calculation the pecuniary loss to the country on account of preventive sickness and mortality may be set down as over $100,000,000 annually, and this without taking into account the cost of sickness. It should be evident therefore that hygiene is not only a subject of

scientific interest to the student or medical man, but that to the political economist and the legislature its problem and discussion ought to be of great practical importance—greater, in fact, than many of the subjects with which these gentlemen usually occupy themselves, and at first sight it may seem strange that it should not receive more attention at their hands. Sanitary measures to be effective should be carried out at those times when most people see no special cause for anxiety and often therefore appear to incur unnecessary worry and expense. When such measures are most successful their value may be least appreciated.

The friends of the typhoid fever patient will not fail to remember and be grateful to the physician for his care and skill in treating the patient, but would have thought him intrusive and troublesome had he taken one-half the same trouble to see that the cause of the fever was prevented. The financial results of municipal carelessness are shown in a computation of the cost to the city of Philadelphia of the small-pox epidemic of 1871 and 1872 by Dr. Lee, who figures it at $21,848,977, while the cost of prevention is put at $800,000. Had intelligent quarantine regulations been rigidly enforced, which would have protected New Orleans from the yellow fever epidemic of 1878, there might have been lost $1,500,000, but their omission entailed a needless waste of $11,500,000.

If we turn to Geneva, Switzerland, we shall find accounts of births and deaths complete for 300 years. From these we learn that in the sixteenth century the average period of human life was a little over twenty-one years. In this century it has risen to over forty years. Then more than one-fourth of the children died in their first year. Now less than one-sixth die in their first year. In the sixteenth century only 3 per cent lived to see three score and ten years; now 18 per cent live beyond that age. As many now live to be seventy as then died at the age of forty-three.

In Liverpool, before proper sanitary measures were introduced, 38 persons in every 1,000 died each year, and now the number is but 22. In England's Indian army the death rate has been reduced from 69 in every 1,000 to 20; in Croydon from 25 to 16; in Saulsbury, from 40 to 19, and in Dover from 26 to 14. Such are the results of proper sanitary laws and their enforcement by properly qualified officers.

But to carry out proper sanitary regulations in a city means that the officers charged with their enforcement have to combat ignorance and selfishness, their motives questioned and in many cases their honesty assailed. In older countries where the pursuit of the almighty dollar is not as in our own, from the cradle to the grave, there is a large class of gentlemen of leisure—men who, having amassed a competence and having time and money at their disposal, give up both for the betterment of their fellowmen. Such men create a moral force in the cause of good government of inestimable value, and having been of the people their words and example have great weight. Unfortunately our millionaires, with but few exceptions, look not beyond themselves.

The pulpit will assail the municipal officers for inefficiency, and this in the shadow of their own chimney, that has been belching forth smoke and soot over their parishioners who, in response to the bell, wend their way to the sanctuary and with devout mein join their pastor in singing, "Praise God, from Whom All Blessings Flow." My reverend brother, in your next political sermon, ask of your hearers how many are defiling the air we breathe. Take for your text, "Cleanliness and Labor for Godliness."

Then we have the reformer of the banquet who in response to the toast, "Our City Government," tells what ought to be done, and while jingling the dollars in his pockets, the result of some questionable or pretty sharp trade, prates about honesty in public office. His own buildings in the meantime are an eyesore to his neighbors, and their condition at all times a nuisance; while their owner relies upon his influence or bulldozing to evade the law.

The World's Fair in our city will cause a vast amount of new buildings to be erected, and the renovating and adaptation of old buildings to new purposes, while from ten to fifteen thousand new buildings will be erected each year. It would be impossible for the ten experts now in the department to properly supervise this work. There should be a corps of not less than twenty-five practical men for this duty. The present and future health of our city demands it. In my last annual report I called attention to this in the following:

"Public opinion approves of a periodical examination of all places of habitation and employment by qualified inspectors to rectify the errors in construction of plumbing, drainage, ventilation, etc. We found whole rows of blocks with sinks which had never been provided with traps, and there are thousands of costly residences whose waste-pipes and soil-pipes were never ventilated. The neglect of former health officers is responsible for this serious defect. With a sufficient number of practical plumbing inspectors to cover the 170 square miles of territory, the state law and city ordinances relating to sanitary arrangements of buildings could be generally enforced. The enforcement of the rules is a boon to the poor man, whether purchasing or building a house, for he could not himself superintend the plumbing and drainage of a house in the course of construction and would be at the mercy of any dishonest contractor. The half million inspections alleged in the reports up to May 1, 1889, did not much improve the plumbing in the houses of the working people, nor even of the middle classes; and the labor organizations which caused the passage of the factory and tenement inspection ordinance, never intended that the inspections should be made by any others except skilled and practical plumbers, who should get a fair salary for their responsible position. I find that it requires special ability and conscientious attention to duty to discover violations and abate them."

The estimate for the department of health for the year asks for no increase for this division. Everything has been subserved for the improvement of the scavenger service and its importance cannot be denied, but the patient sick with typhoid fever, breathing the sewer-ladened air from defective drainage and plumbing of his dwelling, is not helped. His friends and physician will be more concerned about the conditions around him and their remedy than in that of the alley 100 feet away. The vigilance and good work of this division of the department of health has unearthed the shameful and vile condition of many of our public buildings, and the judges of our courts who day after day breathe he polluted air from open sewer and catch basin should lend their aid that such evils may be remedied. Every respectable physician who values the lives of his patients should aid us by voice and pen. Every citizen who has followed the remains of a loved one to Calvary or Graceland, and discovered all to late that death came from the defective sewer of their home, should aid us, for were the truth but known the words of the sermon would not be the chastening hand of the Almighty, but would hold the scampish and greedy hand of man responsible for the death of the loved ones.

The thousands of citizens who built homes the past year and got what they contracted for through our inspection should aid us. We need it, for the opposition will be strong against our request. Every scamping plumber and drain layer, every Jerry builder and every fraud and cheat of the building business will make common cause against inspection. Honest work is not in them nor of them, and thorough inspection is a death-blow to their occupation.

When times are prosperous, the streets of our cities noisy with traffic, the depots and docks crowded with freight, taxing to the uttermost the capacity of cars and ships, it is not easy to induce people to take thought of the evils to come, nor are they disposed to listen with satisfaction to those who trouble their content by urging on them drainage or sewerage or other costly works needed to secure dry, clean soil, pure water and air free from dangerous or offensive contamination. They say to the sanitarian who is warning them: "Hush; wait a little; don't make a fuss, you will injure the reputation of the city; you will drive away commerce; we are no worse than our neighbors, nor than we have been before; we will attend to these matters bye and bye, for you are probably right in your advice. But wait until after the election—we must not propose additional taxation now or we shall be defeated," etc., etc.

It was so in the olden time. "Yet a little sleep." "So shall thy poverty come as one that traveleth, and thy want as an armed man, and to the great city which felt as if it should sit as a lady

forever there came in one day widowhood and the loss of children." It is very easy to be cynical over public health organization and administration, not only in this, but of all countries. What is done is so far short of what might be done. The practice corresponds so little to the theory that there come hours in the life of every sanitarian when he is inclined to think that it is a waste of time to contend with the self-satisfied ignorance, or short-sighted selfishness which opposes every effort of prevention or restriction of disease. Such moments of doubt and discouragement are, however, by no means peculiar to sanitarians; they came to every man, and it is fortunate for civilization, morality and science that they came but seldom and are usually of brief duration.

The truth is, as Kingsley says, that the egg is by no means addled, though the chick often breaks the shell in a somewhat cross-grained fashion. We pass to and fro, through our nights and days, like a shuttle through the web, occasionally catching a glimpse of the pattern we are helping to weave, but these glimpses are few and short—quite as often on the wrong side as the right—the pattern is very large, and each of our lives forms but a single thread in it—hence it is not strange that it often seems distorted or shapeless, or that we cannot see the effect of our labors.

It is our business, each in his own place, to do the work that lies next at hand for us, and to do it with our might, seeing that there is neither work nor advice nor knowledge nor wisdom in the grave whither we go. ANDREW YOUNG.

DISPOSAL OF SEWAGE.*

Sufficient experience has been gained, however, concerning the latter to obtain some approximate figures for the amount of sewage dilution required to prevent objectionable conditions. In a paper read before the American Public Health Association (Vol. XIII of Trans.) I have collected some fragmentary data on the subject, reduced them to a common measure, and indicated the inferences to be drawn. It is there said:

"The first point to settle is a proper measure for the permissible pollution. This is best assumed as being the quantity of water which can safely receive the drainage from a unit of population; in other words, the least number of cubic feet of water per minute which should flow down the stream for say one thousand persons draining into the same. By using this measure we eliminate the difficulties arising from a varying quantity of water consumation and dilution of sewage before reaching the stream.

"The problem then is, how much running water must we have to dilute the sewage from every one thousand persons in order to make it inoffensive, not objectionable to manufacturing interests, or destructive to fish?

"The standard of inoffensiveness must of necessity be one of personal judgment, and can only be approximate. The admissible sewage pollution of water used for manufacturing purposes depends on the particular industry, some mills require a much higher standard than others; and, unless in any particular case the nature of the industry is a governing element, we are again obliged to resort to personal judgment as to what is a fairly clean water for average cases. A standard of pollution which, thirdly, will prevent the destruction of fish depends upon the particular species which it is desired to retain. Yet, as we find fish living in sewage-polluted water which is sufficiently diluted to answer the first and second requirements, we can usually ignore this one, except in occasional instances, where it assumes special importance, and where special experiments will become necessary."

After stating the manner in which practical results could be obtained from existing information and describing the instances in America and Europe where approximate measurements had been made, it is said:

"By comparing those results, and also those of the other rivers mentioned, we can observe much similarity and consistency, and, for the present, we may draw the following inference: Rivers not to be used for water supplies, but to be inoffensive to communities residing a few miles below, to remain fit for ordinary manufacturing purposes, and to sustain the life of fish, may receive the sewage from one thousand persons for at least one hundred and fifty to two hundred cubic feet of minimum flow per minute, supposing that natural subsidence of the heavier matter takes place immediately below the town discharging the sewage.

"Beyond the above limit it appears to be advisable, when arranging for a sewage disposal, to resort to its purification at once by land or other filtration, or by chemical precipitation, in order to prevent the river-water from becoming objectionable to others.

"While the above figures may be a useful guide in many instances, yet they are but empirical formulæ, to be used only by those who thoroughly understand the subject, and to be applied only in cases similar to those from which they were deduced."

We are more fortunate in the way of exact data regarding the purification of sewage by land filtration. The Massachusetts State Board of Health has, for several years, been engaged in experimenting on this subject at Lawrence, Mass., where a station has been erected for the purpose. In the nineteenth annual report (1888) it is said, in regard to areas that may be selected for filtration, that, at present, no one can tell the character of the effluent water that will result from the application of sewage in large or small quantities, nor the effect of our winters and of long storms upon the efficiency of the soil, nor the proper intervals for application. This knowledge could only be obtained by trial and careful observation. An appropriation was therefore secured and the necessary experiments made. They at present still continue and results are being reached, which, for the first time, place the entire subject of sewage filtration upon a scientific basis.

The filtering grounds comprise about two-thirds of an acre. Upon them are ten tanks, circular in plan, about seventeen feet in diameter, and allowing for material to be filled in five feet deep. From the lowest point in the bottom of each tank a two-inch pipe conveys the drainage to a flume within a building, whence the effluent is taken for analysis and examination.

The tanks were filled with different materials, as follows: No. 1, very coarse, clean mortar sand; No. 2, very fine, nearly white sand; No. 3, peat; No. 4, river silt; No. 5, brown garden soil, well manured; Nos. 6, 7, and 8 were filled with three feet eight inches of coarse and fine sand, ten inches of yellow sandy loam, and six inches of brown soil; No. 9, very compact, sandy, hardpan of clay, sand, and gravel, covered with nine inches of brown soil. No 10 was used to measure the rainfall and evaporation. The sewage used in the experiments was taken from a main sewer draining a portion of the city. Apparatus were erected for measuring the sewage and the effluent, and biological and chemical analyses of both were made daily. The sewage was applied intermittently at intervals of one or more days, and disappeared from the surface in a few minutes or hours.

From the last report of the Board we gather the following statements regarding the general results which were so far obtained:

"Sewage can be much more efficiently filtered through open sand than through sand covered with soil. Very fine material, like dust, in the upper layers of a filter, prevents free access of air, and when wet, may exclude air so completely as to render purification impossible. With soil or sand containing dust at the surface, periods of intermission in the application of sewage may be made so long that the surface, becoming dry, may allow air to enter, and a high degree of purification may result; but the quantity of sewage that can thus be purified is very much less than when the upper layers of the filter are composed of open sand, through which the sewage will rapidly disappear, and will leave room for air to enter and come in contact with the thin laminæ of liquid covering the particles of sand.

Filtering areas of sand covered with soil, or areas of very fine sand, may be much increased in efficiency, in both summer and winter, by digging trenches in the direction of a slight incline, about two feet deep, and one foot wide, and six feet apart, and filling them with coarse sand. The sewage should be applied to this coarse sand, and once in a month or two, a half inch in depth should be taken from its surface and replaced by clean sand.

"A very few vegetable organisms that can be identified by the microscope have been found to occasionally pass through the coarser filters; but in general none come through.

"Of the still more minute organisms, the bacteria, we found that soon after sewage was first applied to the tanks they came

* Wrttten for the State Board of Health of California by Rudolph Hering Civil and Sanitary Engineer of New York.

through in great numbers, but became reduced in number, and during the later winter and spring months amounted to 2 per cent. and less of those of the applied sewage; but after nitrification commenced they decreased rapidly, and continued through the summer, in many cases, less than one hundred, and, in some, less than ten, while the number in the same quantity of applied sewage was about a million.

"The experiments made to the present time show that the number of bacteria in the sand decrease very rapidly from the surface downward. In the finer sands they nearly or quite disappear before the bottom is reached. Experiments are in progress to prove whether any live to come through the finer sands with the effluent; but they have already shown that through the very coarse sands they are brought with the effluent in very small numbers, with the ordinary rate of flow from the sewage tanks, and that when the rapidity of flow is the highest, the number of bacteria in the effluent has reached as high as 2 per cent. of the number in the applied sewage.

"In some of the tanks it appears, that of the large number of species found in the sewage, a single species only lives to reach the outlet.

"We have reason to hope that the filters may be so made and managed that all disease germs may be, with certainty, removed, and think this important subject should be pursued to definite conclusions.

"The tanks, which were filled with clean, coarse motar sand, received sewage at the rate of thirty thousand, sixty thousand, and one hundred and twenty thousand gallons per day. Until nitrification commenced—after periods of forty-one, thirty-one, and twenty-seven days, respectfully—97, 94 and 80 per cent of the impurities of the sewage were removed. When nitrification reached its height, the ammonias were reduced to 1 and 1½ per cent of those of the sewage.

"The rapidity of purification, as shown by the decrease in ammonias, was greatest in the tanks which had received the most sewage, and had the greatest amount of nitrogenous matter stored in them, the effluent from the sand which had received the least sewage being more than a month later in reaching its condition of greatest purification.

"The filter receiving sewage at the rate of one hundred and twenty thousand gallons per acre per day gave an effluent for three months after purification, resulting from nitrification, was established, in which the ammonias were less than 1½ per cent of those of the sewage. Upon increasing the amount filtered to one hundred and eighty thousand gallons per acre per day, the ammonias increased, but for the next four months averaged less than 2 per cent of those of the sewage.

"The filter receiving sewage at the rate of sixty thousand gallons per day for seven months after purification was established, gave an effluent of nearly constant quality, having one-half of 1 per cent of the ammonias of the sewage, the free ammonia averaging 0.0012 parts, and the albuminoid ammonia 0.0015 parts in one hundred thousand parts, showing less organic matter than many of the drinking waters of the state."

Experiments were made to ascertain the different effects of continuous and intermittent filtration. "In intermittent filtration the nitrification was active, and, as shown by the ammonias, 99 per cent of the organic impurities were removed; while in continuous filtration the nitrification ceased, and the same sand, filtering the same quantity of sewage, stored the impurities for a time, but poured out an affluent quite as impure as the applied sewage."

Fine sand was found to make the best filter, and could purify the sewage to a higher degree at a rate of twelve thousand gallons per acre per day, so that the number of bacteria in the cubic centimeter was reduced from five hundred and ninety-one thousand to two, and the ammonias to one fourth per cent of that of the sewage.

Garden soil was found to make a very poor filter or purifier. After applying only ten thousand gallons per acre per day for eight months, the effluent was "more impure than the applied sewage." The bacteria numbered one hundred and nine, while in the sewage they numdered two hundred thousand.

A mixture of coarse and fine sand and gravel filtered sewage very satisfactorily at the rate of twenty-five thousand gallons per day in the winter, and forty-two thousand gallons per day in the summer. The bacteria of the effluent numbered fourteen, while those of the sewage numbered three hundred and fifty thousand.

Peat was found to be entirely inefficient as a purifier, the ammonias in the effluent being equal to those in the sewage.

The filter containing loam and sand gave an effluent very nearly as pure as that from the sand and gravel alone, but the quantity of sewage which could be filtered was only one-third as great.

A report giving a very full description of the details of the investigation and further conclusions will soon be issued, and will form a most valuable contribution to the knowledge of the world upon the subject of sewage disposal. While much of the information applies to a climate which for several months is both damp and cold, many of the results will be equally valuable for the climate of California.

The land disposal of sewage is a question which will be of peculiar interest to the citizens of your state, as irrigation during the dry season is of vital importance, and water at that time assumes a high value. Besides accomplishing a sanitary benefit, it may therefore also be made remunerative from a financial point, which cannot generally be said of such works in the Eastern states, and you may expect to find this method of sewage disposal a favorite one. However, to make sewage farms pay a profit should always be a secondary consideration, the sanitary question being held uppermost.

Regarding the often expressed fear that sewage farms create a nuisance and injure the value of neighboring property, I quote the following paragraphs from a report upon the disposal of the sewage of Los Angeles City, made in December, 1889:

"Sewage farms need not cause any nuisance. Some smell may be noticeable at the ditches towards evening when the air is damp, and on muggy days. It may particularly be the case when the sewage is not delivered fresh.

"There is no well authenticated case where sewage farms have caused sickness. In England people reside on lands adjoining them. In Paris and Berlin new villages have sprung into existence since the sewage has been used for irrigation, and the death rate is recorded as being little over one-half of that of the respective cities.

"In order to have a minimum amount of odor, it is necessary to convey the sewage in open, artificial, and smooth channels or carriers, and allow it to run in earth ditches only for temporary purposes; and where it immediately filters away, these ditches should be frequently raked over to be kept clean and pure."

Those who have inspected the successful sewage farms in Europe and America can bear testimony to their freedom from nuisance, when proper care is taken with the distribution of sewage and the ditches. This care simply consists of faithful attention. It is neither irksome nor expensive, and is capable of being secured by appropriate legislation.

From what has been stated in these pages it can be seen that by means of the advances of bacteriology the question of sewage disposal has emerged from the realm of doubt, and by assuming a position which allows an intelligent and rational perception of some of the main requirements necessary for its solution, has become a science. Although much still remains to be accomplished, the engineers of to-day are in a better position than formerly to solve the question, and avoid the risk of failure.

HEALTH IN MICHIGAN, JANUARY, 1891.

For the month of January, 1891, compared with the preceding month, the reports indicate that cholera infantum, whooping-cough, dysentery, cerebro-spinal meningites and typho-malarial fever decreased in prevalence.

Compared with the preceding month, the temperature was slightly higher, the absolute humidity was less, the relative humidy was as the same, the day ozone and the night ozone were slightly more.

Compared with the average for the month of January in the five years, 1886–1890, cholera morbus, membranous croup, influenza and puerperal fever were more prevalent, and whooping-cough, cholera infantum, typho-malarial fever, diphtheria, measles and typhoid fever were less prevalent in January, 1891.

For the month of January, 1891, compared with the average of corresponding months in the five years, 1886–1890, the temperature was higher, the absolute humidity was more, the relative humidity was slightly less, and the day and night ozone were more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of January, 1891, at seventy-eight places, scarlet fever at one hundred and one places, typhoid fever at forty-one places, and measles at seventy places,

Reports from all sources show diphtheria reported at eight places more, scarlet fever at one place more, typhoid fever at same number of places, and measles at thirty-seven places more in the month of January, 1891, than in the preceding month.

HENRY B. BAKER, Secretary.

LANSING, Mich., February 5, 1891. [Thayer.]

TRAPS AND VENTING.

Editor of THE SANITARY NEWS: In answer to Mr. Kelley, and speaking from some little experience in the working of traps, I wish to say a word on the trap question. There is no doubt that no simpler form of trap exists than the S trap, but this is not enough; there must be strength. To arrive at this, many devices have been brought forward, among which are the Bower, Cudell and Montgomery traps, spoken of by Mr. Kelley.

The first two are clearly obstructed traps, and, after use, will with difficulty carry off the waste-water from bowls and sinks. The Montgomery trap, with the Detroit Anti-syphon trap, is but one form of bottle or pot trap, sure to fill at bottom and top.

Any person taking up a "Sanitas" or "Puro" trap will see at a glance that there is no obstruction in waterway; that all parts are self-washing, and there is strength enough in holding the seal to safely carry the largest outlet that is met with in plumbing.

Referring to the syphonage of traps in high buildings, with large and straight vents, it has been impossible in several instances to protect the S trap on the lower floors. In private dwellings instances have come up where, from intricate runs and freezing, the S trap has again and again failed, and the drainage has been protected by the adoption of scientific and good appliances like the McLellan vent or Sanitas trap. In every case the result was satisfactory.

Against Mr. Kelley's remark on the traps mentioned by Messrs. Putnam and Waring as collecting filth, it must be remembered that both these gentlemen endorse and uphold the 1½-inch waste-pipes. The traps are made to conform to this and larger diameters, and it is impossible, with fair and ordinary household conditions, to stop them with the proper free outlets.

Regarding evaporation, much has been said on both sides. Experiments generally show that water is very volatile. The rapidity of evaporation is naturally influenced by the state of the atmosphere. The friction of pipes may differ where there is a marked difference in pipe diameters, and so, in my estimation, the 1½-inch vent is equally as good as the two-inch vent. I cannot see any advantage in having the vent larger than the diameter of the pipe, but rather the reverse, as the joining at trap-crown would be a bad job and an obstruction, even with the best intentions on the part of the journeyman plumber. It is safe to say that Mr. Putnam and Col. Waring, and some of the best engineers in the United States and England, have not approached the subject without a thorough knowledge and study of same. Their success during five years does not warrant Mr. Kelley's attack on their understanding the plumbing systems in use.

We all look to advancement; the plumbers will do their share, and I believe I am correct when I affirm that the larger per cent. of thinking plumbers endorse the features brought forward by Waring and Putnam. A working plumber but lately told me that when he had a hard job on sink or basin, he sent for "one of those Sanitas traps, and it did it."

I believe the Sanitas and Puro traps are the product of hard study and exhaustive and fair experiments, and are a credit to their respective inventors. The Sanitas is the older trap, and has so far, to my certain knowledge, been successful under all conditions, and particularly so with proper 1½-inch outlets and wastes.

J. A. CUNNINGHAM, JR.

THE KANSAS MASTER PLUMBERS' ASSOCIATION.

The quarterly meeting of the Kansas Master Plumbers' Association was held in Kansas City, Kansas, on February 9th. The State Association is in good working order, and has had a successful year under the present administration. The association is fortunate in possessing its energetic secretary, Mr. C. J. Prescott, who conducts the correspondence in a very business-like manner, and keeps the public well informed of the progress and needs of the state organization. The present officers are Jas. Foley, of Leavenworth, president; Wm. Stockinger, of Wichita, vice-president; C. J. Prescott, of Topeka, secretary, and R. Mood, also of Topeka, treasurer. The Kansas City *Star* speaks as follows of the recent meeting in Kansas City, Kansas:

The Kansas Master Plumbers' Association closed its quarterly meeting in this city on the evening of February 9th. At the afternoon session on above date a resolution was adopted by the association in favor of changes in the ordinances regulating cities of the state, and recommended the adoption and passage by the city councils of the Chicago plumbing ordinance, it being considered the best in the country.

The association extended a vote of thanks to the Kansas City (Kas.) Board of Trade for the use of the Board-rooms, and adjourned to meet at Topeka next May.

On the evening of the 9th a banquet was served the visitors by Thos. Lloyd and George Hargreaves, at Collins'. Those seated at the tables were William Rowan of Arkansas City, P. J. Lyons and Alexander S. Bowen of Atchison, Charles Allen of Eldorado, T. H. Bowes of Emporia; S. J. Stewart, E. R. Loring, C. C. Stewart, of Hutchinson; S. E. Johnson, Sidney Orme, Fred Doane, of Lawrence; James Foley, Hoffman & Bransfield, Coone & Co., of Leavenworth; H. M. Ziegler & Co., of Manhattan; J. E. Ford, Newton; Cooper & Merrill, J. H. Beasley, of Pittsburg; R. Mood, Prescott & Allen, C. States, Al. Snyder & Co., Mooney & Co., of Topeka; M. Dennody, Kansas Plumbing Company, J. H. Williams, G. W. Burnett, of Wichita.

From Kansas City, Kansas: Thomas Lloyd, Geo. Hargreaves, J. F. Williams, M. T. Betton.

CHICAGO MASTER PLUMBERS.

The Chicago Master Plumbers' Association assembled for the first February meeting, at Grand Army Hall, on Thursday evening, February 12. Owing to the sickness of the president, David Whiteford, Vice-President Cavanagh called the meeting to order, and introduced the guest of the evening, Mr. L. B. Cross, of Kansas City. Mr. Cross made a neat little speech, expressing his delight in being able to meet with the Chicago Association in one of its regular bi-monthly meetings. Mr. Cross, who is president of the Kansas City Association, explained to the members the facts in the $50,000 suit against that association, and stated that he had received word since he left home that said suit had been dismissed at the plaintiff's costs.

The minutes of the last meeting were read by the ex-secretary, A. F. Irons, and were approved as read. The chairman of the Conference Committee, Mr. Boyd, reported the names of his associates on this committee, who are P. Nacey and J. R. Alcock. The association ratified the selection of Mr. Boyd.

Mr. Mandable, chairman of the Sanitary Committee, and Mr. Griffith, of the Warehouse Committee, made their reports.

Charles Breyer, of the Auditing Committee, reported the names of Messrs. Weber and J. Falk as his assistants in this work.

Mr. Wade, of the License Committee, asked permission to increase the number of this committee to seven, in order to re-district the city. The motion prevailed, and Mr. Wade appointed Mr. Thompson for Rogers Park, Mr. D. Rock for North Clark street, Mr. C. Breyer for Milwaukee avenue, Mr. A. W. Murray for West Madison street, Mr. D. F. Dewar for the Englewood district, Mr. J. H. Roche for Thirty-first street, and M. J. M. Morris for South Halsted street.

M. Coleman, of the Arbitration Committee, appointed Messrs. Boyd, Corboy and Murray as his assistants.

The committee appointed on Mr. Augustine Keeley reported favorably upon him, and the gentleman was invited to take the platform and sing a song for the edification of the members. Mr. Keeley kindly responded to the request, and sang two choice selections in a very classical manner.

At the suggestion of Mr. Alcock, National President Griffith was requested to give some advice to the association committees as to their duties for the ensuing year. Mr. Griffith emphasized the fact that there was important work to do, and this work should be done quickly.

Mr. Cross also addressed the association, and said that he had heard in his recent travels more complimentary remarks about the Chicago Master Plumbers' Association than about any other master plumbers' association in the country. He said that you could not pick up a trade paper that did not contain something of interest concerning the progress and work of the Chicago Association. He thought that the Chicago Association was a model for other associations, and the work of the association here for the ensuing year would be watched with great interest by the master plumbers throughout the country.

Messrs. Alcock, Griffith and Boyd spoke on the subject of improving the plumbing trade in a financial way.

Mr. M. A. Gleason, of the Goodspeed Publishing Company, sent a communication to the association, asking for a list of all the officers since its organization, and the sanitary subjects treated by it. A communication from the St. Paul Master Plumbers' Association was read to the society, asking for a copy of the by-laws of the Chicago Association. The request was granted, and the secretary instructed to send a copy to the St. Paul brethren.

The Committee on the Martin Moylan Memoriam reported that it had completed its work, and that copies of the same were with the secretary for distribution.

Mr. Wade made a motion that all pipe and fittings be tested and guaranteed by the manufacturers before they are put upon the market. The motion prevailed.

Mr. Griffith asked for some information on the question of a master plumbers' banquet.

On motion of Mr. Boyd, the association voted to appoint a committee to arrange for a banquet and reception to the new officers for 1891.

The chairman of the Warehouse Committee announced that a very interesting report would be read at the next meeting—on Thursday evening, February 26th—and it was desired that a full attendance be had on this occasion. After a motion to pay certain bills which had accrued, the meeting adjourned until the fourth Thursday evening of this month.

AMONG THE PLUMBERS.

Robert Griffith has recently formed new master plumber associations in Toledo, Ohio, and Evansville, Indiana. He has also infused new life into the associations at Indianapolis, Ind., Louisville, Ky., and Columbus, Ohio. Mr. Griffith was accompanied to Louisville, Ky., by Ex-President E. Hannan, of Washington, Jas. A. Macdonald of New York City, and W. G. Reede of Rochester.

The many friends of James Cameron, of Davenport, Iowa, will rejoice to learn that he and the master plumbers of that city are about to secure real live active plumbing inspectors in the City Health Department. Mayor Ficke is heartily in favor of the project and has recommended the appointment of practical men to the position of plumbing inspectors.

The employes of Mr. Hugh Watt, as a token of their appreciation of his sterling qualities, presented him with an elegant present in the shape of an office chair, on his 66th birthday. Mr. Watt's birthday is celebrated at the same time with that of the poet, Robert Burns.

Harry Black, the genial Secretary of the Chicago Master Plumbers' Association had another experience with burglars last week. The new iron door which he recently put up did not prove a sufficient barrier to protect his worldly possessions, and Harry has now supplemented this with a large watch dog which reigns supreme within during the absence of the proprietor. We wish him better luck in the future, and hope the criminals will be speedily brought to justice.

The Kansas Master Plumbers' Association regards the Chicago plumbing ordinance as the best in the country.

Last week's issue of the *Building Register* contains a supplement presenting the cuts of five houses on the corner of Eleventh and B streets, N. E., Washington, D. C., which have been built for Mr. Ed. J. Hannan, ex-President of the National Association of Master Plumbers. These houses were designed by Architect N. T. Haller, are two-stories and basement, pressed brick and portage stone front with square and circular bays and present a fine appearance. The interiors are of modern finish and we are willing to bet any reasonable amount that no better plumbing can be found anywhere.

National President Robert Griffith speaks very feelingly of the kind reception which the National Executive Committee received at the hands of the Cincinnati master plumbers. The last evening that the committee spent in Cincinnati the local association gave a musicale and ball at the Scottish Rite Cathedral, where the visitors had an opportunity to meet the most prominent people in that city. The committee of arrangements consisted of W. Allison, Thomas McNeill, Richard Murphy, E. A. Dean, F. E. Hopper, J. A. Gibson, C. Homan, J. J. Dowd, W. Wagner, John Douglas, N. K. Aylward and M. Hoykin.

The Ladies' Auxiliary Society of the Chicago Master Plumbers' Association was recently entertained at the home of Mr. Hugh Watt, 55 Union Park Place. Music and dancing were the order of the evening. Mrs. Watt gave a very fine repast, which was thoroughly enjoyed by all. Among those present were Messrs. and Mesdames Mathews, Mandable, DeVeny, Murray, Irons, O'Hara, Bray and Mrs. Griffith. The secretary of the society, Mrs. A. F. Irons, reports the organization in a very flourishing condition.

At this season of balls and banquets among the plumbers of the country, some of the Chicago plumbers have been heard to say "What's the matter with the Chicago Master Plumbers' Association following suit, and showing the world how to get up a real dance and feast."

The first success of the state vice-president of Montana, Mr. M. J. Walsh, has been the forming of the Helena Master Plumbers' Association at his adopted city.

The Charleston Lead Rolling Mill Company has been incorporated at Charleston, S. C., to manufacture sheet lead, lead pipe and to erect a sulphuric acid plant. The capital stock is $35,000. James Grayden, T. A. Moylor and G. A. LeMaistre of Wilmington, Del., are interested.

The committee of the Indiana Legislature, which has been considering the proposed new law regulating plumbing in that state has reported favorably upon the bill which will doubtless before very long become a law. President Griffith recently met quite a number of the legislators and they all spoke favorably of the measure.

A New York master plumber is suing an ex-judge for plumbing work completed some six years ago. The defense is that the judge's wife ordered the work done without any authority to do so. The New Yorkers evidently do not think that good plumbing comes under the head of necessaries for the family. A western judge would no doubt decide that the work done for the New Yorker's wife was necessary for her health, happiness and general welfare, and compel him to pay the plumber's bill in full.

The Hamblin Plumbing Company is now nicely located in its new and spacious quarters at 348 South Roby street, near Ogden avenue. The old veteran plumber, J. J. Hamblin, who is known among the plumbers from the Atlantic to the Pacific, is president of the new company while J. E. Macdonald is secretary and treasurer.

The plumbing business at Eagle Pass, Tex., is in the hands of a monopoly. Master plumber, John Kelly is the monopoly, he being the only plumber there.

The Master Plumbers' Association of Cleveland, Ohio, gave a pleasant reception and an elegant banquet in honor of Robert Griffith, during his recent short visit in that city. Mr. Griffith addressed the association, in its beautiful rooms at 334 Arcade building, for almost an hour, after which the company adjourned to the Forest City House, where a sumptuous repast awaited them. The feast was followed with the usual speech-making on such occasions, and the Cleveland master plumbers proved to their honored guest that they are capable of holding up their end in oratorical efforts. Mr. Griffith reports the organization in a good, healthy

condition. Mr. Adam Schneider, of the firm of Dewstoe & Schneider, is president of the association.

The Martin Moylan Memorial, printed by Miss Gardner, is now ready for distribution.

The New York State Association of Master Plumbers will hold its third annual convention at Rochester on Thursday, March 5th, 1891. The secretary, D. H. Sullivan, of Rochester, has sent out a circular requesting all master-plumber organizations in the state to send a full delegation to this meeting.

The Corbett Bros. have succeeded the old plumbing firm of McConnell & Bro. at Anniston, Ala., and will increase the facilities of the former firm for first-class plumbing-work.

William Sykes, of Sykes & Co., Mr. Berriman of Rug Fuller & Co., Minneapolis, and Mr. Bothermel of the Duluth Plumbing Company, were among the representatives of the Northwest who, this week, visited the new show-rooms of the Rundle-Spence Manufacturing Company, at 193 Lake street.

J. J. Wade & Son are getting up a new catalogue of their sanitary specialties, which will soon be ready for distribution among the trade.

TRADE AND BUSINESS NOTES.

The trade of Chicago has a decided acquisition in Mr. Henry Stephen, late of Philadelphia, an enterprising and thoroughly modern young business man, who has just moved into good quarters at 224 E. Washington street. Mr. Stephen is Western sales-agent for a number of the most recent and approved appliances in building and in household economy, among which are Austin's expanding conductor, the Giant Manufacturing Co's builders' stirrups, the Sims patent eavestroughs, mitres, roof-gutters, ridge-rolls, etc., Stilson's "Gem" stovepipe-thimbles, and all the well-known Climax specialties. Mr. Stephen represents also the Self-Cleaning Boiler and Tank Co., who claim the only sanitary circulating boiler made, and put out therein a very novel and practical feature. We shall have to refer our readers to Mr. Stephen's advertisement and to himself for all the particulars of his extended line. We believe this gentleman destined to quick success in the wide-awake Chicago trade, for he represents solid firms and good goods, and is himself fit to act as agent for such. His stock is full, and therefore orders are handled at once.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago: Van Buren street, four-story hotel. Perley Hale, architect. George Busse will build a store and flat building; cost, $15,000. Henry Sierts, architect. Twenty-fourth and La Salle streets, three-story factory. Huehl & Schmid, architects. Diversey avenue, three-story flat building. J. A. Bongard, architect. Glencoe, two-story residence. Bell & Swift, architects. Charles E. Carlson will erect a three-story apartment building; cost, $25,000. Ostling Bros., architects. W. H. Bartlett will build a handsome stone residence at Evanston. J. L. Silsbee, architect. Jefferson street, W. D. Evart will expend $70,000 in remodeling his building. J. W. Wagner made the plans. C. Changelon will build a three-story flat building; cost, $14,000. J. F. & J. P. Doerr, architects. The same architects planned a two-story sash, door and blind factory, to be erected on Thirty-fifth street. Fifty-sixth street, four-story flat building; cost, $18,000. J. F. & J. P. Doerr, architects. Same architects have plans for a two-story flat building, to be erected on Wabash avenue, and a two-story residence, to be erected on Indiana avenue. Sixty-first and State streets, four-story apartment building; cost, $25,000. Crowen & Richards, architects. Twenty-sixth and West Fortieth streets, three-story apartment building; cost, $60,000. Crowen & Richards, architects. Fullerton avenue, three-story and flat building. R. C. Berlin, architect. The same architect planned a three-story apartment building for M. Brennan. For Wm. Colvin he made plans for three dwellings, to be erected on Forty-seventh street.——Kansas City, Mo.: James H. Oglebay and George W. Jones will, as soon as plans and specifications can be completed and bids be let, begin the erection of a six-story building on Walnut street, to extend from Independence to Missouri avenue, and from Walnut east to the alley. Architect James Bannon is now engaged upon the plans. Cost, $125,000.——Minneapolis, Minn.: 1415-19 Eighth street, S., three-story brick flats; cost, $30,000. Orff Bros., architects. The Y. M. C. A. building will be completed, $50,000 having been loaned to finish the work.——Wabasha, Minn.: The commissioners of this county have decided to erect a new court-house, the cost of which is not to exceed $30,000.——Salt Lake City, U.: Corner South Temple and Third West street, a three-story brick hotel; cost, $55,000. C. H. LaBelle, architect.——St. Louis, Mo.: Lafayette and California avenues, two brick dwellings; cost, $21,000. A. Griesedieck, owner. Pine street and Euclid avenue, a brick dwelling; cost, $20,000. J. Hogan, owner.——Traverse City, Mich.: A $14,000 Catholic church will be erected. Druiding, of Chicago, architect.——Mobile, Ala.: Five-story brewery will be erected; cost, $125,000. August Maritzen, Chicago, architect.——Minneapolis, Minn.: Five-story building will be erected. J. W. Wagner, Chicago, architect.——Danville, Va.: Main street, city market; cost, $35,000. Wm. Poindexter, Washington, D. C., architect. City school; cost, $20,000; architect, same.——Suffolk, Va.: City market and opera-house; cost, $20,000. Geo. C. Moser, architect.——Wheeling, W. Va.: Main street, store and office building, four stories high; cost, $25,000. Joseph Leiner, architect.——Ludlow, Ky.: This town expects to build a school-house this spring; cost, about $30,000.——Winchester, Ky.: Opera-house, brick and iron; cost, $20,000. A. O. Elzner, architect.——Reidsville, N. C.: The city will hold an election to vote on the issuance of $50,000 of bonds for improvement purposes. The mayor can give further information.——Dallas, Tex.: The Texas & Pacific Railway Co. will erect a $100 000 office building.——Detroit, Mich.: Architects Malcombson & Higginbotham have plans under way for a three-story brick residence with stone trimmings and slate roof, for Charles E. Bresler, at Grosse Points, Mich.; cost, $40,000. Architects A. E. Walshe & Son have completed plans for ten two-story frame residences for a syndicate composed of F. B. Sibley and others, to be built on Farnsworth street, east, and to cost $30,000. Architects Spier & Rohns have plans of two three-story fire-proof construction buildings for B. Stroh Brewing Co.; cost, $80,000. Architects Donaldson & Meier are preparing plans for an eight-story hotel for Brush estate, to be equipped with all modern improvements, and situated on northeast corner of Croghan and Randolph streets, and cost $80,000.——Cincinnati, O.: Corner of Seventh and Plum streets, remodeling Christ Church; cost, $36,000. W. M. Aiken & E. Ketchum, architects. Corner Race and Fifth streets, eight-story brick and stone stores and office building; cost, $100,000. Rumbaugh, architect.——Glendale, O.: Parish house for Christ Church, stone, with slate roof; cost, $20,000. W. M. Aiken & E. Ketchum, architects.——Middletown, O.: A three-story brick Catholic school-house; cost, $18,000. Samuel Hannaford & Sons, architects.——Canton, O.: A four-story brick business block; cost, $15,000. Wm. Ginther, architect.——Cambridge, O.: Cambridge Iron and Steel Company will build a galvanizing works in the spring, to cost $15,000.——Columbus, O.: Chief Heinmiller recommends the expenditure of $22,000 on new houses and apparatus.——Washington, D. C.: The American Security and Trust Co. will erect an immense granite building on the north side of G street, near Fourteenth street. Stumph Bros. will enlarge their factory, on the north side of Massachusetts avenue, near Seventh street, northwest, by the addition of three stories, making a five-story structure, running through to K street. The plans were made by Architect Joseph C. Johnson. Architect N. T. Haller is making plans for a block of eight dwellings at the southeast corner of Massachusetts avenue and First street, northeast. This block will cost $32,000.——Boston, Mass.: Harvard street, brick engine-house; cost, $25,000. City Architect. 439 Tremont street, brick alteration and addition; cost, $45,000. W. T. Sears, architect. Washington street, corner Motte street, plans are prepared for a new theater, to be called the Lyceum Theater. L. H. Tempard, Rochester, N, Y., architect. Harrison avenue and Stoughton street, Homœopathic Medical Dispensary. Connery & Wentworth, builders. Stoughton, near Albany street, hospital. Massachusetts Homœopathic Hospital, owners. East Concord, corner Albany street, surgery. Mass. Homœopathic Hospital, owners.——Lynn, Mass.: The Boston & Maine Railroad is to erect a depot at this place, to cost $100,000.——Holyoke, Mass.: A stone church; cost, $50,000. French Catholic Society, owner.——Pittsburgh, Pa.: The South Side Turn-Verein will begin the erection of a new hall in the spring, on Sarah street, near South Eleventh, to cost $60,000.——Frackville, Pa.: Lehigh avenue, a frame store and dwelling, hot-water heating; cost, $12,000. W. D. Hill, architect.——Mercersburg, Pa.: The council is considering

the question of erecting a new fire-station.——Philadelphia, Pa.: Ann and Cambria streets, three-story office building will be erected by T. W. Smaltz. Seventh and Callowhill streets, market-house. Harold Godwin, architect. Architect Edward F. Durang has plans for a church, school-house and large residence. Mifflin and Twentieth streets, church building will be erected by the Evangelical Lutheran Jerusalem congregation. T. Frank Miller, architect. Chestnut street, west of Forty-first street, Hamilton School building. J. W. Anschutz, architect. The Wilmington Turngerneide will erect a handsome building. Market and Eighteenth streets, several stores and warehouses. J. E. & A. Le Pennock, contractors. Washington and Twentieth streets, two-story factory will be built by D. H. Davidson. Buttonwood and Thirteenth streets, the Keystone Spring Works will build a large factory building. West side of Sixth street, eight houses will be erected by R. & A. Wilson. Thirtieth and Walnut streets, an immense coal-shed will be built by Contractor A. A. Campbell. Indiana and Fillmore streets, Barnes & Beyers will erect a large factory. Geissinger & Hales, architect. Second and Jefferson streets, Roman Catholic Church of St. Michael's will be erected. Edward F. Durang, architect. The General U. S. Grant Post, No. 5, G. A. R., will erect a new post-hall on the south side of West street. Sixteenth street and Pennsylvania avenue, an immense warehouse will be erected for the Penn. Warehouse and State Deposit Company.——Pottstown, Pa.: A large store will be built by L. & W. C. Beecher.——Bridgeton, N. J.: A new school-house will be erected.——Trenton, N. J.: Green Street Methodist Episcopal Church will erect a $50,000 edifice.——Camden, N. J.: The Horneff Boat Club will build a large boat-house during the coming season,——Lambertsville, N. J.: George W. Arnett will erect six handsome residences.——Newton, Pa.: A new church will be built by the Baptist congregation.——New York City: Forty-second street West, five-story brick Turkish-bath building; cost, $85,000. T. H. Poole, architect. 530-534 41st street, five-story brick stable; cost, $50,000. 133d street, four five-story brick flats; cost, $84,000. E. B. Cole, architect. 113-117 Baxter street, brick church; cost, $30,000. 95th street, six four-story dwellings; cost, $155,000. A. B. Ogden & Sons, architects. 68th street, three five-story brick flats; cost, $54,000. 176-180 Grand street, six-story brick store; cost, $75,000. Clendon & Putzel, architects. 72d street, near Lexington avenue, five-story brick stable; cost, $100,000. L. Weiker, Jr., architect. 237-239 29th street, two five-story brick flats; cost, $46,000. 212-216 92d street, five-story brick brewery; cost, $80,000. O. C. Wolf, architect. 101st street, near Columbus avenue, two five-story flats; cost, $30,000. M. F. Walsh & Co., architects.——Brooklyn, N. Y.: Hooper and Keap streets, one-story stone sawing-mill; cost, $20,000. D. W. Hunt, architect. 350-352 Bedford avenue, two four-story brick stores and flats; cost, $20,000. Julius Boekell & Son, architects. Van Cott avenue and Sutton street, four three-story brick tenements; cost, $25,000. Frederick Weber, architect. The commissioner of city works will invite the submission of sketches and plans for a five-story building to be erected for fire-department headquarters, from such architects as he may select. The cost of said building is not to exceed $100,000, and said plans and sketches are to be submitted February 16, 1891.——Elmira, N. Y.: The citizens are discussing the proposition to issue $370,000 of bonds for public improvements, as follows: For street improvements, $100,000; sewer extensions, $75,000; purchase of a site and the erection of a new city hall, $70,000; increase of fire-department facilities, $35,000; building of three lock-ups and the introduction of the Gamewell system of police patrol, $15,000; erection of a new free academy, $75,000.

HEATING AND LIGHTING.

Monson, Me.: The Monson Electric Light and Power Company has been incorporated.—— Bloomsdale, Pa.: The Bloomsdale Electric Light and Power Company has been organized with a capital of $25,000. W. R. Tubbs is president.——Leslie, Mich.: The city is to have electric street lighting.——Stroudsburg, Pa.: The Stroudsburg Electric Light Company will extend its service to East Stroudsburg. To accomplish this its capital has been increased from $15,000 to $30,000.——Kalamazoo, Mich.: The City Electric Light Company has increased its capital to $60,000.——Marlborough, Mass.: The Germania Electric Company has been incorporated to manufacture the Shaefer incandescent lamp and electric supplies with a capital stock of $250,000.——Morrisonville, Ill.: The Morrisonville Electric Light Company has been incorporated with a capital stock of $4,000, to furnish electric lights. The incorporators are H. C. Bohn, J. W. Campbell, E. D. Green and A. E. Gowin.——Lake Charles, Fla.: J. A. Landry & Co. will erect and operate the electric light plant.——Baltimore, Md.: The International Telegraph District and Construction Company will put new machinery in and enlarge its electric light plant.—— Palestine, Tex.: A stock company will be organized to erect another electric light plant.——Del Rio, Tex.: Prices on electric light plant equipment are wanted by Clyde L. Woods, Box 32.——Saratoga, N. Y.: The Saratoga Gas & Electric Light Co., has bought out the Consumers' Gas & Electric Light Co., and will build a new electric light plant.——Chartiers, Pa.: The Chartiers Electric Light Co. will erect a plant. The directors are: D. Healy, R. McMunn, C. Durham and J. Lee.——Richmond, Va.: The City Council has voted $75,000 for purchasing an electric light plant.——Clarksdale, Miss.: The City Council wishes bids for erecting water-works and an electric light plant.——Arcola, Ill.: The city will erect a municipal electric light plant. Further information may be obtained from S. R. Coan.——Columbus, O.: Bids are wanted for furnishing a municipal lighting plant.——San Diego, Cal.: Bids will be opened Feb. 19 for lighting the city.——Redwood City, Cal.: The City Trustees desire bids for furnishing the following machinery and supplies: One 12 x 12 automatic cut-off engine complete; a horizontal tubular boiler 64x16; a dynamo for supplying 30 to 35 arc lights of 1,200 c. p. each; a dynamo for supplying 300 incandescent lamps of 16 c. p.; wire poles, etc.——Colorado, Tex.: An electric light plant will be erected.——Baltimore, Md.: A $500,000 stock company is being organized by New York and New England parties to build $200,000 electrical works in Baltimore, Md. William Keyser can give information.

SEWERAGE NOTES.

Memphis, Tenn.: Col. Waring has been appointed Consulting Engineer to the Sewerage Department of Memphis, where his system was first introduced in 1880, and where it has been, and is being greatly extended.——Springfield, Mass: A sewage plan has been suggested providing for turning the course of the town brook and building a sewer through upper Liberty and Ferry streets.——Paterson, N. J.: An ordinance is before the Board of Aldermen providing for the construction of the large East Side sewer.——Buffalo, N. Y.: The Committee on Sewers has reported in favor of the Albany street trunk sewer.——Cicero, Ill.: A sewer is proposed to be built by Chicago, on Robinson street to connect with a sewer to be built in Cicero to Mud Lake.——Avondale, O.: Plans and specifications are being prepared by Mr. Arthur S. Hobby, civil and sanitary engineer, of Cincinnati, for about three miles of sewers, to be constructed this year.——Cincinnati, O.: Sewers to the amount of $400,000 will probably be constructed.——Dallas, Tex.: City Engineer D. A. Poynor has made an estimate amounting to $297,500, to be expended on the proposed completion of the sewerage system.——East Portland, Ore.: Mr. Rudolph Hering, of New York, is preparing the plans for the city's system of sewerage, and has presented a report on the assessment question, in which he recommends that the system he paid for by assessing the abutting properties at a certain rate per foot of frontage.——Hanford, Cal.: The Hanford Drainage & Sewerage Co. has been incorporated by Nathan Weisbaum, John H. Melone and Frank L. Dodge.——Brantford, Ont.: Mr. Willis Chipman, City Engineer, states that it is expected to construct 12 miles of sewer this year at a cost of $100,000.——Greeley, Col.: The Mayor of this city has been authorized to consult a sanitary engineer on the question of a general system of drainage.—— Marquette, Mich.: Considerable sewer work is to be done. The City Clerk can furnish particulars.——Parkersburg, W. Va.: The City Council has authorized the construction of numerous additional sewers.——Buffalo, N. Y.: The Council Committee on Sewers has authorized the construction of the Albany Avenue sewer, at an estimated cost of $70,000.——Atlanta, Ga.: Ordinances have been introduced in the city council providing for the extension of the Loyd street sewer at a cost of $40,000, and the Butler street sewer at a cost of $50,000.——Summit, N. J.: The town committee has under consideration

plans for a sewerage system, presented by a Newark engineer. The cost is estimated at about $35,000.——Los Angeles, Cal.: The city council is discussing plans for an outfall sewer.——Manchester, N. H.: The committee on sewers and drains of the city council has asked for the purchase of a twelve horse-power boiler and pump combined for use in the sewer department.——East Providence, R. I.: There is a demand for the extension of the sewerage system. The cost of the desired work is estimated at $8,000 to $10,000.——Chicago, Ill.: Surveyors sent out by the public works department of the city have been taking levels in the old town of Jefferson. The object of their work is to obtain information that will be required as a preliminary to the building of a system of sewers.——Oakland, Cal.: The proposed intercepting sewer on First street, between Union and Peralta streets, with which the lateral sewers in the neighborhood are to be connected, is to be built forthwith. The sum of $3,500 was appropriated for the work.——Winona, Minn.: Plans have been submitted by U. H. Broughton of Chicago, for a sewerage system.——Newton, Mass.: The city council has adopted an order authorizing the issue of sewerage bonds for $400,000.——Hoboken, N. J. A committee of the common council has reported in favor of constructing a new system of sewerage upon the plan suggested by Civil Engineer McCann. The legislature will be asked to authorize a loan of $100,000 to pay for the work.——Cohoes, N. Y.; The city is earnestly discussing the question of improved sewerage and street paving.——Brockton, Mass.: City Engineer F. Herbert Snow in his annual report makes a strong argument in favor of a sewerage system.——Milwaukee, Wis.: The Board of Public Works estimates the money required for sewer building in 1891 as follows: East district, $50,281.30; west district, $75,227.90; Bay View district, $3,257.80; south district, $29,458.85; south Side special fund (Beecher street), $29,458.85; special fund (intercepting sewers) $90,000.

WATER WORKS NOTES.

Donner's Grove, Ill.: A determined effort is now being made to establish a system of water-works.——Denver, Col.: The High Line Reservoir Company is the title of a new incorporation, whose object is to construct and operate reservoirs from the High Line canal in Arapahoe, Douglas, Jefferson and Park Counties. The incorporators are Stephen R. Pratt, president of the Farmer's Protective Union; James L. Oakes, Cyrus G. Richardson, Lewis J. Wells and Byron A. Wheeler. The company is capitalized at $50,000.——Colorado Springs, Col.: During the coming year the city of Colorado Springs will improve its water system by construction of reservoirs, extension of water mains, etc. Address A. H. Gorman, city clerk.——Pasadena, Cal.: The Pasadena Land and Water Company will issue $50,000 in bonds for water-works improvements, including considerable pipe laying.——Cedar Rapids, Ia.: The city will put in one 80 horse-power boiler and two miles of pipe this year. Address Charles J. Fox.——Tekamah, Neb.: The question of water-works is being agitated.——Seattle, Wash.: The Board of Aldermen have adopted an ordinance providing for the purchase of sites for the two new chemical engines at a price not to exceed $10,000 each, one to be in the second ward and the other in North Seattle.——Spokane Falls, Wash.: City Engineer Oskar Huber has submitted to the city council two propositions, accompanied by plans, for the improvement of the present water-works system. The first is to build a reservoir, with a capacity of 15,000,000 gallons, to cost from $175,000 to $200,000. The other plan is for an enlargement of the present system, with the addition of a powerful force pump to carry the water to the highest portion of the city by direct pressure.——Victoria, N. C.: S. H. Reed, Charles McNamee, M. E. Carter and others have applied to the North Carolina Legislature for a charter for the Asheville and Victoria Water Supply Company. The company proposes to organize for the purpose of supplying South Asheville and Victoria with water.——Columbia, S. C.: The city will construct a new water-works system to be operated by water power, and for that purpose will issue $75,000 of bonds.——Parkersburg, W. Va.: The water mains of this city are to be extended into the new wards. The Mayor can furnish particulars.——Franklin, Tenn.: An election will be held for the purpose of deciding as to the construction of water-works.——Stephen, Minn.: As soon as the bill for bonding the village has been passed by the senate and signed by the governor, the city will proceed to advertise for bids and to purchase the materials needed. Address C. K. Stackland.——Luverne, Minn.: A bill has been sent to the legislature authorizing this town to issue bonds for the purpose of putting in a system of water-works.——Grand Rapids, Mich.: President Davis, of the Board of Public Works, has recommended the expenditure of $100,000 on making general improvements and extensions to the local water-works system.——Boulder, Col.: Improvements are soon to be made to the reservoir at Sunshine Canon.——Attala, Ala.: The city will issue $25,000 of bonds for the construction of a system of water-works. L. B. Whatly can give information.——Brenton, Ala.: A bill has been introduced in the legislature to authorize the mayor and city council to issue $25,000 of bonds for water-works and other improvements.——Jasper, Ala.: A bill has been introduced in the legislature providing for the incorporation of the Jasper Water-Works Company.——Uniontown, Ala.: The city expects to construct a standpipe and lay about two and a half miles of mains. Address J. C. Welch.——Montgomery, Ala.: The bill authorizing Montgomery to establish water-works has become a law.——Greensboro, Ala.: The town is now boring a well for a water supply, and if the experiment is successful a system of water-works will be constructed. Address W. W. Powers, Mayor.——Milledgeville, Ga.: The city has decided to have water-works erected. Address Mayor Peter J. Cline.——Carrolton, Ga.: Henry Lamer, is authority for statement that the city will put in a water-works system. Bids are solicited. Address Henry Lamer.——Athens, Ga.: Additional hydrants will be set this year. Address M. L. Wood, Superintendent Water Works.——Rome, Ga.: L. J. Wagner, Superintendent Water-Works, can give information concerning the proposed increase of present water supply.——Atlanta, Ga.: W. G. Richards, superintendent of water-works, may be addressed concerning the new pumping plant that will be put in this year.——Denton, Tex.: A stock company has been organized to construct water-works. The company is known as the Denton Water, Light and Power Company, and has for president, J. Rourke.——Waco, Tex.: The Waco Water and Light Company has been incorporated; capital, $500,000.——Vicksburg, Miss.: C. H. Fitler will need a pump.——Portland, Ind.: This city contemplates building water-works this year. Address F. H. Snyder, mayor.——Cleveland, Ohio: Water mains extensions to the amount of $30,000 or $40,000 will be made.——Canton, Ohio: The water board is receiving bids for a 4,000,000-gallon pumping engine.——Lebanon, Pa.: A new impounding reservoir of 40,000,000 gallons capacity will be constructed.——Hagerstown, Md.: The water company will put in an additional 1,000,000 gallon pump.——Somersworth, N. H.: A bill is before the New Hampshire Legislature empowering Somersworth to establish water-works.——Farmington, Conn.: A complete system of water-works will be constructed this year. Address Thomas L. Porter.——Meriden, Conn.: An additional reservoir will be built this year. H. L. Schleiter, superintendent of water-works.——Hoboken, N. J.: The Hackensack Water Company intends to lay an extra 20-inch water main from the reservoir at Union Hill to Hoboken, N. J.——Lockport, N. Y.: A committee, consisting of Frank N. Trevor, Perry Stowell, Julius Frehsee, Chas. W. Hatch, Dr. Charles N. Palmer and John D. Walsh, has been appointed to consider the water supply question.——New York City: Senator Canton has introduced a bill in the state senate which authorizes the issue of bonds in the sum of $500,000, for the construction of a new pumping station in the upper part of this city.——Rochester, N. Y.: The city will ask from the legislature authority to issue bonds to the amount of $1,750,000 to obtain an additional supply of water. This is Engineer Kuichling's estimate of the amount required for a supply of 15,000,000 gallons exclusive of the cost of a new reservoir on Cobb's Hill and the supply pipe therefor. The estimate is for a 36-inch conduit to Hemlock lake or a 38-inch conduit to Conesus lake.——Schenectady, N. Y.: The common council has decided to ask the legislature for power to issue $125,000 in bonds for the proposed change of source of water supply.——West Troy, N. Y.: The Watervliet Water Company has been incorporated to furnish water to West Troy and Green Island. The principal office of the company is in Syracuse and the capital stock is $100,000. The business of the concern is in the hands of the Board of Trustees, consisting

of Charles T. Moffett, Edward G. Cook and Fred B. Robin.——Holbrook, Mass.: The water commissioners have been authorized to purchase a new pumping engine jointly with Randolph, to be used in case of accident to the present apparatus. The cost of the pump will be about $3,000.——Lynn, Mass.: The council has concurred with the board in the order instructing the treasurer to secure a $150,000 water loan.——Manchester, Mass.: At a special town meeting on February 2nd, the report of the committee on water supply, recommending that a supply be obtained from Saw Mill Brook, near Crafts Spring, the estimated cost being $114,000, was accepted, and the following committee was chosen to petition the legislature for the necessary permission: Samuel Knight, R. C. Bingham and William Heare.

BIDS AND CONTRACTS.

Ft. Payne, Ala.: L. D. Cochran opens bids Feb. 19th for a court house.——Topeka, Kan.: Proposals are wanted until Feb. 19th for the construction of a system of water-works on the reunion grounds at Ellsworth, Kan. Address H. M. Hadely, No. 627 Kansas avenue.——Santa Ana, Cal.: Sealed proposals will be received by the City Clerk of the city of Santa Ana, for the construction of a complete system of water-works. The said system to be a combination of the stand-pipe, with the Holly or direct pressure system, according to plans and specifications now on file in the city clerk's office in said city. Bids will be received up to 5 o'clock P. M. of March 16th, 1891. The capacity of said water-works shall not be less than 1,500,000 gallons in twenty-four hours. The distributive system will require about 40,000 lineal feet of pipe. Sixty double fire hydrants, twenty-two gates and 7,000 pounds special fittings. The stand-pipe will be 16 feet in diameter, and 140 feet high. Power house, 36x42 feet. Reservoir, 78x98 feet, inside measure; depth, 10 feet; walls, concrete. A copy of the specifications will be furnished on application. Ed. Tedford, City Clerk.——San Diego, Cal.: Proposals are wanted until Feb. 19th for lighting this city with electricity; 11 masts with six 2,000 candle-power arc lights each, and 22 single 2,000 candle-power lights. Address the city clerk.——Berryville, Va.: Proposals are wanted until March 2nd, for the construction of a complete system of water-works. Address T. S. Thompson. ——Columbia, S. C.: Sealed bids, accompanied with plans and specifications, for furnishing the city of Columbia with a 3,000,000-capacity pumping station, to be driven by water-power, with all necessary machinery, consisting of pumps, water-wheels, filtering plant, pipe-connections, stopcocks, etc.; also a complete stand-pipe, not less than 20 feet in diameter and 75 feet high, to be erected near the present reservoir on Arsenal Hill. Bids must include all necessary masonry and earthwork for foundations, including a protecting wall or breakwater, to be placed north of the pumping station, for protection against high water, will be received at city clerk's office, in the city of Columbia, at noon, March 2, 1891. Address W. J. Cathcart, city clerk,——Mare Island, Cal.: Sealed proposals, indorsed "Proposals for Steam Engineering Stores for the Navy Yard, Mare Island, Cal., to be opened Feb. 24, 1891," will be received at the Bureau of Provisions and Clothing, Navy Department, Washington, D. C., until 12 o'clock, noon, Feb. 24, 1891, and publicly opened immediately thereafter, to furnish at the Navy Yard, Mare Island, Cal., a quantity of stores, consisting of hardware, lumber, tin, iron, steel, paints, tools, etc. Blank proposals will be furnished upon application to the commandant, Mare Island, the Navy Pay office, San Francisco, Cal. The attention of manufacturers and dealers is invited. Edwin Stewart, Paymaster General, U. S. Navy.——Newton, Mass.: Sealed proposals, addressed to the Joint Standing Committee on Sewerage, of the city of Newton, and indorsed "Proposals for Vitrified Sewer Pipe, and Tile Pipe," will be received at the office of the City Engineer, City Hall, West Newton, Mass., until 12 o'clock, noon, of Friday, Feb. 20, 1891. Specifications and all information to be obtained at the office of the City Engineer. Wm. F. Harback, Chairman Joint Standing Committee, Albert F. Noyes, City Engineer.—— Portsmouth, N. H.: Sealed proposals, indorsed "Proposals for Building Material, etc., for the Navy Yard, Portsmouth, N. H.," will be received at the Bureau of Provisions and Clothing, Navy Department, Washington, D. C., until 12 o'clock, noon, Feb. 24, 1891, and publicly opened immediately thereafter, to furnish at the Navy Yard, Portsmouth, N. H., a quantity of building material, consisting of granite door sills, copper rain water conductors and gutters, roofing paper, paints, spruce lumber, etc. Edwin Stewart, Paymaster General, U. S. Navy.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

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WE publish in this issue, for the information of our readers, the objections raised against the drainage scheme. This is published as in no way reflecting the views of the SANITARY NEWS, but in response to requests for information on the subject. Every one can answer the objections in his own way in the presence of the question, "What is Chicago to do for pure water without proper and adequate drainage?"

MR. F. E. CUDELL, of Cleveland, O., the inventor of the Cudell sewer-gas and back water trap and other sanitary appliances, gave us a call last week and gave us some new ideas of his regarding ventilation in plumbing. Mr. Cudell, besides being an inventor and manufacturer, is an architect by profession, and has had large practice and experience in building construction which he has turned to good results. Through the kindness of Mr. Cudell we will soon be able to publish his plan of ventilation with illustrations and descriptions, and bespeak for it a wide consideration.

THE *Tribune*, in answer to a question by a subscriber, asking if there was such an officer as Smoke Inspector in Chicago says: "Technically there is no such officer as Smoke Inspector. A man named Young, however, is paid $1,800 per annum and two subordinates are paid $1,000 each with the understanding, as far as the public is concerned, that they are to use their best efforts to suppress the nuisance. It may be that, like other city hall politicians and like policemen generally, they are attending now to the matter of booming Mayor Cregier for re-election." This is another evidence of the extreme inconsistency and unreliability of that paper. It is not fair, it is not honest, it is not decent. Many times has that paper praised the efforts of Chief Inspector Young in his success in abating the smoke nuisance, and now, simply because an election is approaching, it stoops to cast such a mean reflection as the above. Mr. Young has done more, and succeeded better in abating this nuisance than have all his predecessors together. In truth he is the only man that has made any headway with this very difficult problem, and his success has been marked. His efficient efforts in this direction have won for himself and Chicago highly flattering mention not only throughout this country, but in European cities. He has done more for Chicago now than *The Tribune* ever did or will do, and he is still energetically pushing the work forward. No man can point to a single act in the official duties of Mr. Young that bears the least mark of politics or party policy. His administration has been clean, energetic, just and courageous, and no man or paper could do Chicago a worse turn than to suggest in the most indiscreet way his retirement, or cast any reflection that would tend in the least in this direction. The *Tribune* is too hasty in making politics out of everything that comes along, and its unbiased opinion of Mr. Young's labors is to be preferred to its warped partisan utterances.

THE SMOKE NUISANCE.

But few subjects have attracted more attention in the principal cities of this country and in Europe than the smoke nuisance. More than fifty years ago there were ordinances enacted in London to suppress the nuisance, and since that time other cities on the continent have followed the example set by London and have enacted such ordinances. Chicago was the first city to pass such an ordinance in this country and most of the cities have followed the example of this city, until the principal cities have special legislation upon that subject; but as yet we have no record that any city has accomplished the removal of the nuisance, which proves conclusively that simply to make laws upon the subject will not bring about the much to be desired results. The cause is plain enough; it all arises from the incomplete combustion of bituminous coal. The argument that combustion cannot be made complete has long since been exploded, and it is not necessary to go outside of Chicago to find that it is done practically and profitably. It is a reckless waste of fuel to let huge volumes of black smoke escape from the chimney of any kind of a furnace, either of locomotive, tug, steamboat or stationary boilers. A great deal has been accomplished in Chicago during the past year and yet the work has just commenced; but enough has been done to show the practicability of abating the entire nuisance.

As to which particular branch of industry we are to look for our relief, it is hard to say. Engineers as a rule are not furnace builders, and many of the most learned in the art of engineering stick to the old idea that smoke cannot be burned. Chemists have decided long since that smoke cannot be burned, and as all our experts and scientists base their knowledge upon the fundamental principles of chemistry, they have to stick closely to what they learned in school. Experiments have been made recently in Butte City, Montana, under the directions of the Health Department. The sulphur fumes in one furnace were burned in another of the same construction, after having been treated properly with oxygen and hydrogen. These experiments were of great importance to the manufacturing world at large, and were the first that were found successful in burning sulphurous fumes from smelting ores, and will go a long way toward removing the opposition of a class who pose as experts on all subjects, whether they are familiar with them or not. All volumes of smoke are composed largely of sulphur fumes whether they are from burning ores or coal. While the smoke coming from bituminous coal is heavily laden with soot or bituminous matter and is black, smoke from smelting ores has no soot.

But smoke is a nuisance; it is injurious to health and vegetation and a bar to cleanliness and should be abated. The man who succeeds in abating the smoke nuisance of some one city, will place his name at the top of the list of those who have accomplished great things.

THE DRAINAGE CHANNEL.

REPORT OF THE POLITICAL-ACTION COMMITTEE OF THE HAMILTON CLUB, CHICAGO, JANUARY 2, 1891.

To the Members of the Hamilton Club—Gentlemen: Your committee has investigated the question of the proposed drainage channel, and begs leave to report as follows:

By an act entitled "An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois rivers," enacted by the General Assembly of the State of Illinois and in force July 1st, 1889, it is provided that certain sanitary districts may be incorporated with large powers to provide for the drainage of said districts, and to levy taxes therefor. As is well known, such a sanitary district has been incorporated, embracing a large part of the City of Chicago and some adjacent territory, and the trustees provided therefor have been duly elected and have entered upon the discharge of their duties, and are about to commence work upon a certain proposed channel from Chicago to Joliet, and thence via the Desplaines and Illinois rivers to the Mississippi river, and which channel is required to be 160 feet wide, with a depth of 18 feet in one part and 14 feet in another, with a flow of not less than 300,000 cubic feet per minute, and provided that when the population of said district shall exceed 1,500,000, such channel shall be made of a size to maintain a continuous flow of not less than 20,000 cubic feet of water per minute for each 100,000 of population. It is proposed to construct the channel on the basis of a population of 1,500,000, which will render it necessary to enlarge it so soon as the population of the district shall exceed the above number, and which limit, assuming that said channel cannot be constructed within three years, will be reached within that time, rendering an enlargement necessary before the channel is completed.

Your committee believes that, while it is not so expressed in the act above cited, it was generally understood by the voters of the district and the people throughout the state that the above channel, with connections, should furnish a continuous navigable waterway for lake craft from Lake Michigan to the Mississippi river. This idea, however, has practically been abandoned by the sanitary trustees, so far as your committee can learn, and the recent report of the engineer of the board does not consider that phase of the question. The character of the drainage channel was largely predicated upon the idea of a navigable waterway as above, and for that purpose assumed that the General Government would grant its active and financial co-operation in improving the Desplaines and Illinois rivers to the Mississippi river, but for which co-operation the district has no greater assurances than the hopes of its promoters; while, on the contrary, the government engineers have reported adversely upon such proposed improvement. It appears that such improvements, even if made, would not be available for the purposes of general navigation to a depth greater than that of the Mississippi at the mouth of the Illinois river, which does not exceed, for miles below said point, a minimum depth of between five and six feet, and that, therefore, even if government co-operation should be received, there would be required for the purposes of navigation a channel not to exceed eight feet in depth from Lake Michigan to the Mississippi, instead of fourteen feet, as proposed.

Your committee further believe that the present condition of the sewerage is largely due to the slight decline in the sewers, thereby giving the sewage but little flow, and leading to the clogging and damming up of the sewers. It is not apparent how this condition can be remedied by a channel the surface level of which, at the point where the sewers empty, will be the same as the lake and Chicago river, thereby giving no greater fall to the sewers nor increasing the flow of the sewage. Your attention is called to the provision in the drainage law which specially requires that "before any sewage shall be discharged into such channel, all garbage, dead animals, and parts thereof, and other solids, shall be taken therefrom;" and as the contamination of our water-supply is due to the presence of these solids, it is clear that the evil can be remedied by removing these solids from the sewage without the aid of a channel to carry off the remaining water. In other words, if the district is required to purify its sewage before using the channel, it is obvious there can be no objection to allowing the purified sewage to flow into the lake, especially with the water-supply drawn through the new tunnel. Either the channel is unnecessary or it should carry off all the sewage. The question of, "What are solids?" is left to the river towns to answer.

But the injury to our water-supply, is of course, primarily due to the fact that a large part of our sewers empty into the lake. The sewers of the North Side do so, and so do the large sewers at Twelfth, Twenty-second and Thirty-fifth streets, and all the sewers of Hyde Park, excepting those of the town of Pullman. These sewers follow the natural watershed, and are built with their incline to the lake. They cannot be tapped in the rear, and no provision is made in the report of Engineer Worthen, nor does the Board of Trustees appear to have in contemplation any plan for the diversion of this sewage. To this extent, at least, the scheme will fail to purify the water-supply.

Your committee report that it is and will be impossible to estimate the ultimate cost of the project. The latest estimate received—and that must be assumed to be at least 25 per cent. below what will be the cost—places the sum at $25,700,000.

This channel commences at Bridgeport and terminates above Joliet. It includes nothing of the cost of running the channel through this city, of the enlargement of the Chicago river, nor does it contemplate a method of diverting any sewage, except such as now flows into the Chicago river. It also has no reference to a waterway.

Your committee does not believe that the law, as it now stands, can be amended so as to accomplish the results desired, and so it recommends the following resolutions for adoption:

Whereas, Under the act passed by the last General Assembly of Illinois, entitled "An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois rivers," a sanitary district embracing a large part of the city of Chicago has been created, and a Board of Trustees elected with extraordinary powers of taxation; and,

Whereas, It does not appear that the requirements of the said act are in accord with the demands of a permanent and efficient drainage system, with the essentials of a purer water-supply, or with the necessities of a proper navigable waterway to the Gulf of Mexico; therefore, be it

Resolved, That a special committee of five be appointed with power to act in the promotion of the repeal or amendment of the above act.

CHICAGO AND THE NATIONAL WATERWAY.

BY GEORGE P. ENGELHARD.*

(Address delivered before the Hamilton Club, Chicago.)

The site of present Chicago and the tributary territory was the field of one of the most terrific and decisive combats ever waged by Nature's forces. In the pre-glacial period, the lakes of Huron Superior and Michigan found their outlet, not through the dreary wastes of a northern clime to the Atlantic, but by the inviting shores of the present Western metropolis through the valleys of the Desplaines and the Illinois where it joined forces with the Mississippi and swept majestically onward to the Gulf of Mexico. Then indeed did the Chicago river divide honors with the St. Lawrence. No Canadian had then the hardihood to assert undivided possession of the outlet waters of our inland seas, and sneer at the wretched river poverty of the ancient denizen of Chicago.

Assuming the presence of population and civilization, we may picture a vast imperial city, the "Constantinople of the continent," the ancestor of great Chicago, powerful in her wealth drawn from the fertile surrounding valleys and renowned in her commerce which plowed not only the seas to the north and east but the imposing river which brought the treasures of the west and south.

But this greatness was destined to an interruption which already has spanned a long vista of centuries. The portentous day arrived with the relentless advance of those Goths of the Ice Period, huge glaciers which crushed all animal and vegetable life, exterminated lakes and rivers, and even put to torture and finally death the noble range of mountains which reared their crests from Lake Superior to Northern Indiana. Buried deep in this continental sepulchre of ice, the fiery spirit of Chicago was for once subdued. For many years—good authorities place it as high as forty thousand—she lay thus bound and nearly congealed. It was

*In presenting the facts and conclusions set forth in this paper the writer desires to acknowledge his indebtedness for expert engineering data to the very able and exhaustive report to Congress by Captain Marshall, of the United States corps of engineers, to the valuable treatise on the "Lakes and Gulf Waterways" by L. E. Cooley, C. E., to Gordon H. Nott, C. E., Geo. W. Waite, C. E., and others. G. P. E.

an ordeal which put to a severer test her faith and recuperative powers than the cyclone of flame which swept over her in later years. But the day of deliverance came at last; the elements relented; warmer breezes began to hold sway, and the ice monster was driven slowly but surely backward. But when the resurrected Chicago came forth, what a transformation had the glacial hordes wrought! Hardly a vestige of the old landscape remained. The high-soaring Wabash arch had vanished; ridges had become peaceful valleys; meadows rose into frowning hills; rivulets thundered as appalling Niagaras; lakes had become dry land and land had become water. But to Chicago the most startling revelation was the divide which pierced the valley of the Desplaines, arrested the waters of the imposing outlet of the great lakes to the Mississippi, and forced them back through the Mackinac and Detroit straits to swell the majesty of the St. Lawrence. The great river to the Mississippi had disappeared. The Desplaines and Illinois rivers and a deserted, though clearly outlined river-bed across the divide, were the mute, sad remnants of a once mighty waterway.

Chicago now found herself on a level with the lake, surrounded by bayous and lagoons with here and there a mound of solid ground. The divide was found to be an average of only six feet above the lake level, reaching its highest point about fourteen miles from the lake, declining to lake level in thirty miles, near Lockport; and then descending precipitously seventy-seven feet in ten miles to Joliet; ten feet more in two miles beyond, and continuing the descent to a total of nearly one hundred and fifty feet to LaSalle, the head of river navigation, in a distance one hundred miles from Lake Michigan.

RESTORATION OF THE WATERWAY.

The destruction of this pre-glacial waterway to the Mississippi, with its attendant continental transformations, has been the subject of fascinating study by geologists, engineers, statesmen and others for many years. The waters of the Atlantic meet those of Lake Michigan by intervening lakes, rivers and canals. Restore the ancient outlet of Lake Michigan; give back to the Mississippi its lost heritage, and the circuit of navigation between the seaboard, the lakes, the Mississinpi and the Gulf will be complete! This is the daring and startl ng challenge which modern enterprise hurls at the helmeted forces of glacial triumph.

Can it be possible that the mighty benefits to accrue to the Nation and to the American people from such restoration shall be much longer deferred?

The commerce of a continent flows unimpeded from the Atlantic to the foot of Lake Michigan where it is rudely stopped and turned back by a paltry hundred miles which defy its rightfnl progress to the Father of Waters. Shall this defiance silence the demands for a water-way, indispensable alike to the proper defense of the Nation in time of war and to its highest prosperity in times of peaee? Shall the greatest and wealthiest nation of modern times, with the genius of modern engineering at its command, longer refuse to inaugurate a work destined to eclipse in the sublimity of its results all former achievements of this or of other countries?

As was asked in the course of an address by Governor Oglesby, at the waterway convention, "does not the National government know that it ought to own at least one through line of transportation? Will not the national government come to feel that it would be a most expedient and judicious thing for it to have unobstructed control of one waterway for commerce in this country that might become the criterion for charges by other modes of transportation? Cannot the people of New England and the East, as well as the people of the South and West, feel the importance of spending a few millions of dollars to open this waterway so that commerce can go by its own easy steps, and, when necessary, war vessels also?" The voice of patriotism as well as of the gigantic agricultural and mercantile interests of the Mississippi valley cries out against further delay, and demands that a broad-minded, generous and intelligent policy shall prevail, unencumbered by petty local interests, and controlled by no government save that of the Nation itself.

THE ILLINOIS AND MICHIGAN CANAL.

The project is no new creation. Albert Gallatin, in 1804, directed attention to the importance of uniting the waters of Lake Michigan and the Mississippi. Clinton and Morris in 1824 eloquently set forth its advantages. Two years before the United States granted the right of way for the Illinois and Michigan canal. The work was promptly undertaken by the state of Illinois and the canal opened to navigation in 1849. It is nearly 100 miles long, six feet deep, sixty feet wide at surface, thirty-six feet wide at bottom and for a distance of twenty-six miles has a summit

THE NATIONAL WATERWAY.
(From the Atlantic via the Lakes to the Gulf.)

level eight feet above the lake. As a national waterway it has been a signal failure, owing to the shallowness of the Illinois river, which it was expected the general government would improve adequately for general navigation. In the hope that congress would complete and enlarge the waterway, the state of Illinois, in 1882, tendered the canal to the United States, but congress, on the advice of a federal board of engineers, declined to accept it, preferring, if it did anything, to utilize the Illinois river for a waterway, rather than the canal between Joliet and LaSalle. Complications with Chicago's drainage problem were also feared, as the canal was the receptacle of a large portion of the city's sewage.

THE PROBLEM REVIVED.

The Illinois and Michigan canal having proved so wofully inadequate to its purposes, and having so grievously disappointed the hopes of its projectors, the old problem again pressed forward,—How shall the great National waterway become a fixed fact? While rival sectional interests were debating the question, congress, on Aug. 11, 1888, authorized the Secretary of War, "for the purpose of securing a continuous, navigable waterway between Lake Michigan and the Mississippi river, to make the proper surveys, plans and estimates for a channel improvement of the Illinois and Desplaines rivers from LaSalle to Lockport, so as to provide a navigable waterway not less than one hundred and sixty feet wide and not less than fourteen feet deep."

The duty imposed by these plans and estimates was assigned by General Casey, United States Chief of Engineers, to Capt. W. L. Marshall, the officer in charge of the improvement of the Illinois river, whose report, dated February 28, 1890, is, beyond question, the most exhaustive in its details of routes, surveys and estimates, and the most complete in its information and all facts bearing upon tbe drainage subject, of all related literature.

AN ADVERSE REPORT TO CONGRESS.

In making provision for the surveys, congress was no doubt influenced by petitions from certain circles in Chicago, contemplating federal co-operation in an ingenious scheme for solving Chicago's sewage problem by floating the sewage on the National waterway. Capt. Marshall's report does not take kindly to the suggestion. The logic of its surveys, plans and estimates, is a scathing arraignment of the proposed sewage highway, demonstrating not only its impracticability and its utter absurdity, but also its ruinous consequences if persisted in.

"As the Illinois state law stands," Captain Marshall declares, "demanding a constant discharge and unnecessarily great and expensive channels not demanded nor suitable for the commerce to be subserved, a compliance with its terms does not seem advisable for the United States." "We find this proposed route," he further remarks significantly, "instead of being urged upon a purely national basis, encumbered with conditions that have no relation whatever to national ends or objects, but purely dependent upon local necessities for sewerage and water supply as the real governing basis, while a great waterway is urged as a national necessity to secure United States aid." Engineer L. L. Wheeler, who was in immediate charge of the surveys, is no less emphatic in his conclusions. Referring to the disadvantages to navigation by the proposed sewer waterway through the Chicago river from the lakes he says:

The river is spanned by twenty-four bridges, all of the largest and costliest type. The traffic over the bridges in the central portion of the city is enormous and the opening of one of them interrupts street traffic for blocks away. The river is thronged with lake craft of all kinds both day and night, and the bridges require to be constantly on the swing to permit their passage. At certain hours of the day, however, the pressure of street traffio becomes so great that the bridges are not opened at all and vessels must wait at their docks or in the harbor until the bridges can be opened. In order to make a waterway 160 feet wide through the Chicago river to Bridgeport suitable for Mississippi river steamboats it would be necessary to reconstruct twenty bridges, at an estimated cost of $2,250,000, and to acquire 325,000 square feet of ground, the estimated value of which is $450,000 and to construct 11,500 linear feet of new dock, at an estimated cost of $172,500. To these amounts would have to be added $165,000 for excavation and a large amount for land damages, which it would be impossible to estimate."

These facts, Mr. Wheeler concludes, would "forbid this route as an outlet to the lake" and all other proposed routes within the old city limits are "no less objectionable." Even with a width of 160 feet, however, navigation in a current of three miles per hour and a stream but 160 feet wide would be fraught with extremely hazardous consequences to the numerous river vessels of a length double the width of the channel. The rapid current required by the drainage act for purposes of drainage is, moreover, as Capt. Marshall points out, irreconcilably hostile to the conditions of safe and efficient river navigation.

Following the demonstrated facts and disinterested arguments in this, as in all former reports to Congress on the subject, and guided by the investigations and judgment of scores of other engineering experts for the state and city, the Nation will unquestionably (unless balked by the Chicago drainage absurdity) soon stand committed to the project of a pure and independent National waterway, but never to a scheme which would degrade the majestic enterprise to a mere sewer outlet for Chicago, in violation of every law of decency, of sanitary science and of sound economics.

ORIGIN OF THE CHICAGO DRAINAGE DISTRICT.

Let us review briefly the development of the Chicago sanitary district, and the colossal folly which prompted its formation. Finding the general government indisposed to take immediate action, but disposed rather to avoid the Chicago river route altogether, the projectors bethought themselves of a plan whereby the city of Chicago, single-handed and alone, should undertake, at her own expense, the construction of a waterway for the state and Nation. The idea was fascinating. Long had learned sanitarians wrestled with the perplexing problem of the disposal of the city's sewage; long had certain enthusiasts dreamed of Chicago sitting enthroned at the head of a mighty river which linked the destines of a continent. Could not the problem of the dream be happily combined and the drainage and the waterway project be pushed forward to joint completion? As the thought progressed, the estimates of cost gradually contracted, while the advantages rapidly expanded. A committee was finally appointed which reported in favor of a waterway 160 feet wide and eighteen feet deep from Lake Michigan through the Chicago river to Joliet.

Into this Danube of the West Chicago could turn all her sewers, thus promoting, it was urged, the health of all her inhabitants and those of the farms, towns and cities located along the banks of the stream. Such an undertaking would cost, at the modest estimate of its promoters, not less than twenty millions of dollars. The indebtedness of Chicago was already thirteen millions of dollars—five millions in excess of the constitutional limit of five per cent. How then was the money to be raised? None could be borrowed, and the current municipal expenses consumed all the annual taxes of the full constitutional limit.

AN INDEPENDENT TAXATION MUNICIPALITY.

It was at this critical point a fertile brain evolved the idea of a separate and independent drainage municipality for Chicago, with separate and independent taxing powers whereby the bonded indebtedness of the territory comprised in the limits of the city might be doubled. This was in plain violation of the spirit of the constitution, but, once siezed by the ship-canal fascination, considerations of fact, law and equity lost all force. The next step was to embody the ideas in a draft of a bill, which was duly presented to the last Illinois Legislature, backed by a lobby of unprecedented size and of all degrees of persuasiveness, plasticity and unscrupulousness. The towns along the route of the proposed canal, and in the tributary valleys, made the most of their opportunity. They demanded everything as the price of their support. Amendments were fired at the bill from all quarters of both legislative branches. Chicago yielded point after point. Several city representatives were disposed to protest, but the lashings of the city press and the curses of the ravenous spoilsmen who swarmed about the capital, preserved an unbroken front for the Chicago contingent. There was great rejoicing when the bill finally passed. Then began the process of suburban annexation, to fortify the conspiracy against independent municipal action by any portion of the proposed district. Annexation accomplished, the next step was to make sure that opposition to the creation of the district was disarmed in advance. A joint session of the central committees of both the great political parties was called; arrangements for the election were perfected and an agreemeut entered into to print on the ballots only the affirmative proposition. The proposition, as a matter of course, carried quite unanimously.

Thus far the drainage coterie had won an uninterrupted series of triumphs. They had successfully duped the Legislature, the people of Chicago and the party representatives; but, strange to relate, in the nominating conventions for drainage trustees, they found themselves unable to dictate the nominees. The Republican convention named Republicans, and the Democratic convention named Democrats, utterly ignoring the demands of the now arrogant drainage leaders. In their dilemma, they deserted their dupes, called themselves together, patched up a so-called "citizens' ticket," and on election day again came forth triumphant.

It was a brilliant fight and a famous victory; but in their subsequent calculating moments the people of Chicago began to investigate the real meaning of the drainage act, the actual powers vested in the drainage board and the probable consequences of the affair to themselves as citizens and taxpayers.

OBJECTS OF THE DRAINAGE LAW.

The avowed purposes of the drainage act were: (1) To enable Chicago to maintain a pure water supply by diverting all sewage from the lake. (2) To provide a means for the most rapid and effective disposal of all the city's sewage, and, (3) To authorize the construction of a channel adapted to the demands both of an adequate sewage outlet, and of a great navigable waterway to the Mississippi.

If the facts shall justify the conclusions that the vast undertaking bears no necessary relation to the problem of pure water; that for purposes of drainage it would prove utterly useless, or, at best, but a half-way and temporary expedient, and that, finally, if, instead of providing a great waterway to the Mississippi, it would tend to obstruct, jeopardize and defeat the successful prosecution of this sublime project, would it not be patriotic and wise to call a halt without further delay?

PURE WATER NOT DEPENDENT UPON DRAINAGE.

The importance of a thorough system of sewerage to every community, and particularly to large cities, is impossible of exaggeration. It is more closely related to the health and the lives of the people than any other department of the government service. Pure water and perfect sewage are the vital factors in the physical life of a city. Impure water, or imperfect sewerage, is certain to result in extreme prevalence of disease and a high death-rate at

all times, with periodical ravages of frightful epidemics. The question of a pure water-supply has therefore engaged the earnest attention of all well-governed cities, and, to the credit of Chicago be it said, no other city has given the subject more conscientious thought. Lake Michigan furnishes, practically, the entire water-supply of Chicago. The supply for the recently annexed portion of the city on the north is to be from a point located nearly two miles out in the lake; that for the towns of Lake and Hyde Park is from the Hyde Park crib, located one mile from shore, and that for central Chicago from a point two miles from shore. A new water-tunnel is now being constructed, which will supply the city from a point four miles from shore. The low death-rate of Chicago, as compared with cities against the purity of whose water-supply no suspicion can exist, proves that the reports alleging serious contamination of our drinking-water by sewage are either gross exaggerations or pure fabrications.

The new four-mile tunnel inlet was located after an exhaustive series of observations by the city engineering department, with especial reference to the direction of the lake currents, and thus to the avoidance of contaminated lake-water. With this precaution, and with the vast diluting and oxidizing forces of the lake it may be safely asserted that the new service will supply the city with as nearly pure water as the lake affords anywhere; but even should this be denied, the fact still remains that purity of water is simply a question of distance of the supply from shore, and that this question is one merely of thousands of dollars, where that of a drainage channel is millions.

And here we note, in passing, the strange contradiction involved in the construction of a channel at a cost of millions, designed to keep the lake perfectly free from sewage, and in the location of a tunnel four miles out at a cost of hundreds of thousands, when a half mile from shore under such conditions would do as well.

IMPORTANCE OF DRAINAGE.

But, retort the drainage advocates, even though it be possible to obtain pure water without the drainage channel, is not the channel the most effective and at the same time the cheapest solution of the sewage problem? Here is a vast city of already over a million inhabitants, and growing at a rate which promises a population of over two millions in ten years. Evanston and a part of Lake View, together with a portion of the South Side from Twelfth street, and all of Hyde Park, drain into the lake; all the remaining portion of the drainage district drains into the various forks of the river—by far the greater part into the South Fork, which discharges into the Illinois and Michigan canal. The site of Chicago is everywhere low—so low that, adjacent to the river, it was necessary to elevate it fourteen feet above low water in order to secure proper sewerage. Much of the territory of the district is below lake and river level. Its waters are frequently undecided whether to seek the lake or the Desplaines. During the spring freshets the lake is given the preference, but when the Desplaines runs low the preference is kindly reversed. Under such conditions we should expect to find the serpentine Chicago river the stagnant, noisome thing it usually is. Its slimy deposits and persistent sluggishness clog the sewers and drive back their contents freighted with deadly gases. In view of these conditions, shall the great city of Chicago, already the second metropolis of the New World, and destined soon to become the first, ignore this frightful menace to the health and happiness of its people? Shall it permit the evil to grow and flourish until an appalling epidemic shall teach it the neglected lesson of humanity and common sense? Is any price too high to pay for immunity from the sanitary perils which threaten us under existing conditions? These are the considerations which appeared to justify, to the minds of tens of thousands of Chicago's conservative people, the gigantic measure of relief represented in the proposed drainage channel and the tremendous taxation which it involves.

THE CHANNEL AND THE RIVER VALLEYS.

The question, however, recurs,—Will the channel afford the desired relief? The efficacy of a medicine is surely not always proportioned to the immensity of the dose. It is proposed, in fact the drainage act practically requires, that the channel shall be 160 feet wide and 18 feet deep, with a flow of not less than 300,000 cubic feet per minute, and a current not exceeding three miles per hour. It is asserted that this volume and velocity will insure a sufficient dilution and oxidation of the sewage to render the stream practically pure, and therefore a blessing to the people of the tributary valleys.

The truth of this assertion is challenged by the ablest sanitarians of Europe and America, whose testimony is unanimous against the contamination of rivers by metropolitan sewage. The water may appear pure, but the disease germs of sewage are not thus easily destroyed. High authorities go further and deny that even under the most favorable circumstances, would a stream of such limited volume and uniform current, without rapids or cataracts to expose its impurities to the oxidizing forces of the air, be able to free itself from the physical offensiveness of the fearful mass of sewage from so vast a city. If this be true under favorable season conditions, what shall be said of the condition of the stream during the winter months, when the filthy, disease-laden mass is sealed in ice and thus free to pursue its satanic way to the populations of the river valleys, undisturbed by the atmospheric angels which are supposed to hover over it and cast out the devils of filth, disease and death?

It is, of course, magnanimous in Chicago to endeavor to dump its garbage into its neighbor's front yard, with the assurance that the garbage will, in due season, become oxidized and innocent and sweet; but we marvel at the good nature or the imbecility of the neighbor who not only submits to the outrage, but even lends a helping hand to its perpetration. This phase of the question is, however, one which concerns chiefly the people of the Desplaines and Illinois valleys, though to Chicago it may serve to suggest the important constitutional question, set forth in the brief of Judge Sanford, before the supreme court, as to the right of a municipal corporation "to go outside its own territory to construct a channel for the deposit of its own filth into territory outside its own limits, and not in its own natural basin." This alleged right is contrary to established precedent, is opposed by the most eminent legal authorities, and is in direct violation of the criminal code of Illinois (ch. 38, par. 277). The supreme court in its decision failed to pass on this question. It is held in reserve by citizens of the valleys who may enjoin sewage discharge into the channel even after Chicago shall have expended millions for its completion. This is a contingent liability which the district cannot afford to ignore. The threatened pollution of navigable rivers adds another to the many reasons why the United States government refuses to enter into the proposed Chicago drainage partnership.

WILL THE DRAINAGE CHANNEL ACTUALLY DRAIN?

But will the proposed drainage scheme actually drain? This is the question of vital interest to Chicago. Let the conditions be clearly seen. Since the channel is to be an outlet of Lake Michigan, its surface level must be the same as that of the lake, and of the present Chicago river. How then will the situation be materially improved, save in respect to the greater attractiveness of the river itself? The land will be just as low, and the river outlet just as high as at present. The chief evil to be overcome —the clogging and damming up of the sewers, due to their necessary slight decline—will remain precisely as at present. A face blemish has been removed, but the constitutional disease remains. We have improved the condition of the Chicago river, but the sluggish sewers are as sluggish and menacing as ever. The surface of the stream, not its depth, determines the level of its tributaries at their junction. The sewers must be higher than the surface level of the channel or drainage will be impossible. Did time and your patience permit, it might also be of interest to inquire how the drainage scheme projectors propose to reverse the laws of gravitation and make the vast territory which now drains into the lake divert its sewage into a foreign water-shed.

CONDEMNED TO CERTAIN FAILURE BY THE DRAINAGE ACT.

Let us assume, however, for argument's sake, that everything claimed in behalf of the channel is logical and true. Its supporters are then confronted with the following section (No. 208) of the drainage act:

If the population of the district draining into such channel shall, at any time, exceed 1,500,000, such channel shall be made and kept of such size and in such condition that it *will produce and maintain at all times a continuous flow of not less than 20,000 cubic feet of water per minute for each 100,000 of the population* of such district, at a current of not more than three miles per hour.

Twenty thousand cubic feet volume for every one hundred thousand population is equivalent to one cubic foot for every five

of population. The drainage board has announced its intention to begin with a volume of three hundred thousand cubic feet. This would answer, according to the ratio required by law, for a population not exceeding 1,500,000, a limit which Chicago will reach, under the stimulus of the World's Fair, certainly within five years, or *several years before the channel could possibly be completed.* Should the board start with the maximum volume of 600,000 cubic feet per minute, it would suffice for a population not exceeding three millions, a limit which the city, following its past rate of increase, will reach in from twenty to twenty-five years. Allowing ten years for completing the work, if prosecuted with vigor, we should then have (conceding everything which has ever been or ever can be claimed for it), as the net result of a stupendous scheme of perpetual taxation, a solution of the drainage problem for a period of only ten or fifteen years! This clause in the drainage act is obviously alone sufficient to condemn it in every part as a rational sanitary measure. Nothing short of shameless duplicity or a frightfully distorted sense of official duty

PROPOSED WATERWAY FROM CHICAGO TO THE MISSISSIPI RIVER.

Artificial channel 160 feet wide and 18 feet deep, from Chicago to Joliet, along the course of the Desplaines. Improvement of the Desplaines and the Illinois rivers, south to La Salle. Thence by the Illinois river to the Mississippi river and the Gulf. Low lands subject to overflow extend from La Salle to mouth of Illinois river.

can account for the apparent determination of the drainage board to proceed with its surveys in the face of the law's explicit condemnation of the entire scheme to early and certain fatility.

Just when the exigencies of a vast population shall have become greatest, the city's drainage system, constructed at frightful expense, will have become useless!

It is this startling mathematical fact in the drainage act which imparts a hideous grin to the legislative absurdity under which nine men of alleged sanity are now expending twenty thousand dollars a month for a corps of engineers and clerks and their own inevitable salaries, and under which they have already levied two millions of taxes and are authorized to mortgage the district for fifteen millions, to say nothing of levies for annual taxes and millions by special assessments!

DRAINAGE AND NAVIGATION HOSTILE PROPOSITIONS.

"But," again retort the drainage dreamers, "we deny the sufficiency of your conclusions. You may strike from the list of advantages purer water and better drainage, but have we not remaining the superlative beneficence of a grand ship-canal, which must crown Chicago the autocrat of all mercantile America?" The construction of such a channel is, as has been shown, of the utmost importance to the metropolitan future of Chicago, but will the channel proposed by the drainage board, under the conditions of the drainage act, fulfill the requirements of a proper navigable waterway to the Mississippi?

The law makes no provision for a waterway beyond Joliet. It is urged that the general government will improve the Desplaines and Illinois rivers to LaSalle, the head of river navigation, thus completing the waterway to the Mississippi; but what reason exists for this hope it is difficult even to surmise, in view of the rejection of the gratuitous offer by the state to the United States of the Illinois and Michigan canal, and the uniformly adverse reports by the government engineers against any sort of Chicago drainage-ship canal project.

OPPOSITION BY THE UNITED STATES.

The objection of the federal government to the proposed co-operation is primarily that the drainage idea is fundamentally opposed to the requirements of a National waterway. By the government improvements now in progress in the Mississippi and Illinois rivers it is hoped to secure a minimum depth of seven feet in the Illinois river from LaSalle south; six feet on the upper Mississippi; eight feet from St. Louis to Cairo and ten feet from Cairo to the Gulf. The present depths are from eighteen inches to three feet less than the foregoing. Why, then, the tremendous scheme for a channel *eighteen feet deep* to Joliet—nearly treble the present depth of the Mississippi? If it be to meet the demands of lake craft—requiring a fourteen-foot depth—the terminus of the Chicago channel would of necessity be Joliet; the depth of the rivers beyond, even with the increase consequent upon the augmented volume from the proposed new channel being wholly inadequate to the demands of the lake craft. The waterway should obviously be a consistent whole. It should be either a lake waterway throughout or a river waterway. A channel for lake craft to Joliet, and for river craft beyond, would be a magnificent absurdity. Yet this is precisely what the drainage act requires Chicago, for its part, to do, and at an extra cost, compared with an eight-foot depth, of not less than ten millions of dollars.

But what logic can justify the exigency which forces this discussion at this time? The drainage party does not and dare not deny that the ultimate success of everything it has done and everything it proposes to do is predicted upon the general government completing the waterway from Joliet to LaSalle. For Chicago to attempt this enormously costly extension at its own expense would be criminal madness. Under the circumstances, prudence would suggest postponement of active operations until the general government had at least evinced some slight inclination to entertain a thought of such co-operation, but with an insane zeal and insolent arrogance which rules for to-day if it must die to-morrow, the drainage board rushes blindly forward to its own doom, defiantly attempting meanwhile to extort millions in useless taxation for its brainless project. The plain fact is, that the general government wants not a lake but a river channel, conforming to the rest of the waterway system, and for reasons of economy starting from the Calumet river. Chicago, on the other hand, seeks for purposes of drainage a channel of lake depth, starting from the Chicago river. These views are fundamentally antagonistic, and the Chicago drainage district, therefore, finds itself in the attitude of an heroic engineer who begins work on a huge bridge with no means of completing it beyond mid-stream, and with no hope of assistance from the other side.

THE RUINOUS COST OF THE PROJECT.

And what is this useless ship-canal luxury to cost? The Board Engineer has given several opinions, and an army of assistant engineers is now making surveys preparatory to a report of estimates.

In the meantime, we have these estimates reported to Congress by Captain Marshall for a fourteen-foot channel:

LAKE MICHIGAN TO SAG BRIDGE.

Dredging Chicago River	$ 69,200
Widening Chicago River	96,000
Docking Chicago River	172,500
Excavation, Bridgeport to Sag Bridge (earth, $2,497,250; hardpan, $816,000; rock, $796,480)	4,109,730
Docking, Bridgeport to Sag Bridge	840,000
Bridges (to replace those over the Chicago River when widened to 160 feet)	2,865,000
Right of way	1,167,250
Guard Lock at Summit	398,130
Contingencies, 10 per cent	971,781
Total cost to Sag Bridge	$ 10,689,591

SAG BRIDGE TO JOLIET.

Excavation—earth, $168,000; rock, $7,585,120	$ 7,753,120
Waste gates at Lockport	72,955
Locks	1,667,547
Excavations in basins at Joliet	6,000
Retaining-walls above Joliet	717,700
Retaining-walls at Joliet	140,550
Bridges	410,000
Right of way	142,440
Movable dam	52,908
Contingencies, 10 per cent	1,096,322
Total, Sag Bridge to Joliet	$12,059,542
Chicago to Sag Bridge	$ 10,689,591
Sag Bridge to Joliet	12,059,542
Total, Chicago to Joliet	$22,749,133

The above estimate of over twenty millions of dollars is, as has been said, for a fourteen-foot depth of channel. The Chicago Drainage Act requires an eighteen-foot channel with a grade of four inches to the mile, which would increase the cost by about ten millions of dollars. Here the question again recurs, what possible advantage for navigation to the Gulf of Mexico would be a channel stopping at Joliet? In the absence of co-operation from the United States, to make the channel worth anything, it would need be extended by the Chicago district to La Salle at an additional cost, according to the estimate of the government engineer, of $25,533,630.

There remains also to be considered the possible damages from overflow, for which the district is made liable as set forth in the following clause of the Drainage Act:

Every sanitary district shall be liable for all damages to real estate within or *without such district* which shall be overflowed or otherwise damaged by reason of the construction, enlargement or use of any channel, ditch, drain, outlet or other improvement under the provision of this act. And actions to recover *may be brought in the county where such real estate is situated*, or in the county where such sanitary district is located, at *the option of the party claiming to be injured*, and in case judgment is rendered against such district, the plaintiff *shall also recover his reasonable attorney fees* to be taxed as costs of the suit.

These "reasonable attorney fees" of successful claimants against the district might reach into the hundreds of thousands annually.

As to the extent of lands in the Illinois valley subject to overflow, the following quotation is from Captain Marshall's report to Congress:

Now, at any little summer freshet, producing a discharge exceeding 8,000 cubic feet per second at La Salle, damage by overflow would begin at that point, the artificial discharge being 10,000 cubic feet per second, and with greater natural discharge become more and more widespread as we progress down stream, at times when such overflows would not otherwise occur. Upon all rises of the river producing anywhere near bank-full stages, this artificial discharge would cause flowage damages that would not otherwise occur. The lands would become submerged at high water earlier and the water remain upon them longer than it otherwise would. *From 100,000 to 300,000 acres of lands in the Illinois river valley will be subject to such conditions.*

Estimating the possible overflow at only 200,000 acres, with the damage in any one year at $10 per acre, and we have a possible *annual liability* of $2,000,000. Estimating the land at $50 per acre value, and protection from such annual liability would cost $10,000,000.

It is admitted that the Chicago river cannot be made to carry over three hundred thousand cubic feet per minute. It has been shown that a minimum of six hundred thousand cubic feet will be necessary. An auxiliary channel in the vicinity of Thirty-ninth street will therefore be required, not only to secure a sufficient water supply, but to make the drainage of any part of the southern portion of the district at all possible. The cost of this feeder is estimated at $12,000,000. Captain Marshall places the figure at $14,000,000. A channel to divert the flood waters of the Desplaines, known as the "Bowmanville cut-off," is also a universally conceded necessity. Its cost will be not less than $4,000,000. The flushing of the North Branch of the river will cost $3,000,000. The intercepting sewers from the north line of the city to Eighty-seventh street, to convey the sewage now discharging into the lake into the proposed new channel, will involve a cost of $5,000,000 more.*

We have then a grand total for the sewage and canal systems to Joliet the following:

Cost of level channel from Lake Michigan to Joliet (14 feet depth)	$22,749,133
Additional cost for 18-foot depth channel, as required by drainage act, four inches grade to the mile	10,000,000
Possible damages from overflow	10,000,000
Thirty-ninth street or Hyde Park channel	12,000,000
Bowmanville "cut-off" to divert the flood-waters of the Desplaines	4,000,000
System for flushing North Branch	3,000,000
Intercepting sewers for north line of city to Eighty-seventh street	5,000,000
Total (not including salaries, attorney fees, interest on bonds, etc.)	$66,749,133

This total of over $66,000,000 represents the cost of the system, exclusive of the item for the improvement of the Illinois river to LaSalle, computed by Captain Marshall at $25,533,530, which must be regarded as at least a contingent liability against the district.

MAP AND PROFILE OF PROPOSED WATERWAY FROM CHICAGO TO JOLIET

The shaded portion shows the present limits of the City. The heavy lines show the boundaries of the Drainage District.

This would swell the aggregate to over NINETY MILLIONS OF DOLLARS, all of which indebtedness would be payable, under the terms

*My authority for the estimates in this paragraph is George W. Waite, C. E.

of the drainage act, "within twenty years from the time of contracting the same."

The assessed valuation of the district, with the recent increase by the State Board of Equalization, will be about $225,000,000. The cost of the ship-canal job will therefore represent a mortgage of forty per cent. on all Chicago property. Such a tax would be equivalent to confiscation; it would make Chicago the most desirable place for capital to avoid in the world; it would mean a revolution with no uncertain penalties for the schemers, theorists, speculators and political spoilsmen responsible for the calamity.

True, the drainage act limits the total bonded indebtedness to five per cent. of the valuation of the property in the district, with a proviso that five per cent. shall not exceed the sum of fifteen millions of dollars; but, upon the most moderate estimates of the drainage engineers and statesmen, this limitation will place the district in the foolish position of attempting a job which it knows it can hardly commence with the funds at its command, or in the fraudulent position of beginning the work with the determination of browbeating the people and the Legislature into repealing the indebtedness limitation. No estimate by the drainage mathematicians themselves places the cost of the channel to Joliet, with the drainage accessories at Chicago, at less than thirty millions. The fifteen-million indebtedness limitation is, therefore, by their own admission, either a gross absurdity or a transparent fraud.

SUMMARY.

The objections to the ship-canal drainage project and its taxation conspiracy may therefore be summarized as follows:

(1). It bears no necessary relation to a purer water-supply for the city.

(2). It would, at the best, prove but a partial solution of the sewage problem, and that for a period of less than twenty years, when, under the terms of the drainage act, the system would be wholly useless.

(3). It contemplates a noisome sewage canal to Joliet, harmonizing with no other portion of the waterway system of which it is proposed to make it a part.

(4). It would intensify the bridge nuisance in Chicago to an intolerable degree. The welfare of the entire city demands the diversion of the present river traffic to the lake harbors and the Calumet, and not its further concentration in the river, as proposed.

(5). It threatens Chicago with a financial burden of such colossal and crushing magnitude as to jeopardize investments, alarm and divert capital, retard the general prosperity, and cause great pecuniary hardship and suffering among the poorer classes of the people.

(6). It means a project which must inevitably delay for many years the construction by the general government of a grand National waterway, consistent and harmonious in all its parts, and destined to prove of incalculable value to the Nation, to the entire Mississippi Valley and to the commerce and trade of Chicago.

(7). It means a perpetual menace to the health and comfort of the people of the river valleys.

(8). It is opposed to the experience of London, Paris, Berlin and every other large city on the globe, and must inevitably delay the proper and permanent solution of the sewage problem of the city.

(9). It creates a powerful political oligarchy, fraught with untold possibilities of profligacy and corruption.

It has been my endeavor to set forth clearly the grave defects in the vast undertaking into which the city has launched, and the grave perils which surround it, It is not the part of this discussion to present the numerous other plans for a solution of the great drainage problem. It is sufficient for our present purpose to indicate that the present one is as fundamentally defective as it is certainly destructive of its every alleged purpose.

An appeal to the Legislature at its next session to stay the further progress of the ruinous project appears to promise the most effective and early means of relief. Section 207 of the drainage law provides:

Nothing in this act contained shall be so construed as to constitute a contract or grant between the State of Illinois and any sanitary district * * or to prevent, debar or deprive the State of Illinois from at any time in the future altering, amending or repealing this act.

It is under this clause that the drainage coterie hopes to secure the supplementary legislation essential to its designs, but under it the people may also take the initiative in chaining and throttling the monstrous taxation iniquity.

A through waterway from Lake Michigan to the Gulf along the line of the recommendations of the United States engineers is among the early probabilities if Chicago will but come to its assistance in the broad minded, chivalrous spirit which the Nation has the right to expect. But if the state and city permit the present bigoted, narrow-minded, absurd and ruinous policy of the drainage party to continue, the result cannot but prove disastrous to all the vast national, state and municipal interests involved.

SANITARY PROBLEMS.

BY JOHN A. COLE, C. E.

(Paper read before the Hamilton Club, Chicago, Jan. 13, 1891.)

Sanitary science, although by no means unknown to the great nations of antiquity, may almost be claimed as a modern achievement. Baconian methods of investigation have, in the past century, developed marvelous results in the study of diseases and the phenomena affecting the physical well being of man,

Superstitions that formerly ascribed the ravages of disease to some occult influence of the stars, have faded away and hope has been kindled as one discovery has followed another. Jenner, by vaccination for small-pox; Wells, by the discovery of Anaesthesia; Pasteur, by his cure for hydrophobia, and Koch, with his promise of relief for consumption, have not only attacked but disabled the most formidable foes of our race.

It would be impossible for us in these days to realize the extent of the ruin which war and disease have accomplished in the past history of the world. But when we consider, for instance, the fact given by Bancroft that the total number of Aboriginees found in this country east of the Mississippi river, when the Pilgrims landed on the New England coast, was considerably less than 200,000, we probably obtain a correct view of the condition of all savage races. But few escape the ravages of war and disease. Stanley describes the process of extermination going on in Africa, where thousands of square miles are left without an inhabitant by the remorseless slave hunters, who kill scores to obtain one slave.

It is no later than the 14th century since the entire known world was ravaged by a plague, against which men were utterly powerless. Originating in China, it swept with resistless power westward over Asia and Europe. It is estimated that nearly 40,000,000 died in Asia, and 25,000,000 in Europe. Not more than one in ten of the inhabitants of England were left alive, and it is said that there were thousands of towns and cities in Europe left without an inhabitant, while India was almost depopulated.

It seems surprising that our race, with such a history as it has made in its slow march upward through the centuries, can to-day muster over one thousand three hundred and fifty millions. But with all the progress that has been hitherto made, there remain problems of the utmost importance yet to be solved. Especially does the tendency of the times, which concentrates so large a proportion of our population in cities, create new and embarassing emergencies. The art of the skilled sanitary engineer must keep abreast of the discoveries of the physician and scientist, in order to guard our cities from infection and diseases.

THE MENTAL CONDITION.

But before considering the physical remedies and appliances which are required to insure the health of our communities, let us remember that the mental condition of a people is not to be neglected. The regal control exercised by the mind over every function of the body, gives it indeed a first claim to attention. Especially do we, as citizens of Cook County, Illinois, need to be reminded of this fact. Nothing so tends to ward off disease, as a sound, brave mind. Possessed of such, one may pass scathless through valleys of death and contagion. It is not possible to overestimate those habits, customs and associations that tend to produce a contented, enlightened and cheerful state of mind in the community. Music, art and literature must be welcomed and fostered among all classes. In Germany a concert is as cheap as a loaf of bread, and looked upon as being about as needful. In

France business hours are shortened, and great place afforded for recreations. The result is seen in the long lives of many of its active citizens. While in England there are out of 100 deaths but 25.6 that fall between the ages of 60 and 90, there are in France 33.4. A large percentage in favor of rational amusements.

In Europe there are families who are famous for financiering the affairs of nations, whose members live to a good old age. But how often we see the Chicago business man prematurely gray and stooping, or hear of the stoppage of all his intense enterprise, by the sudden giving way of heart or brain. It is one of the sanitary problems of our lives how to reduce the number of hours devoted now to labor, and replace work with diversions that shall cultivate, cheer and ennoble the mind. Magnificent progress has been made already in the past few years by the erection of our Auditorium and Art Institute.

GOVERNMENT AID.

One of the principal lines of reform in older countries has as yet received but little attention here, though it is of vast importance—that of providing healthy homes for the poorer classes The evil of crowded, unwholesome tenement houses is less, probably, in Chicago than in any other city of its size, and yet the evil is great and increasing. Here should be felt the restraining and paternal hand of government. The *poor* are the helpless, and their poverty is their destruction. Nothing is more properly a subject for municipal action by any city than that of providing healthy homes for the poorest of its citizens. I am not saying that the government should furnish houses to the poor, but that it should provide, by legal enactments, for the destruction of unwholesome dwellings, and require strict conformity to sanitary law in all new constructions. It should also see to it that means of transportation are provided, quick, safe and very cheap, from the dense city center to the suburbs, where cottage homes can be afforded. If necessary, *subsidies* should be given to railways, to secure a penny fare at certain hours of the day.

Such socialism as this, liberally and gladly administered by the more favored classes of our citizens to the struggling poor, would destroy the weapons of Nihilism and Anarchy.

There are other lines upon which the government should make its power felt more than at present, as, for instance, in that of food and milk inspection. I have seen the traditional Elgin milkmaid with a short pipe in his mouth, scrub his milk cans in the filthy puddle which receives the drainage of the cow sheds. It is frightful to think of the helpless mother who buys such polluted milk for her puny babes. It is absolutely impossible for the individual purchaser of a quart of milk to insure its purity, but the government can, and should do this with the utmost rigor.

Municipal reform upon sanitary lines is mainly directed toward securing a good water supply; toward disposing in a judicious manner of sewage from houses, and in the cleaning of streets and alleys, including the destruction of garbage. England is estimated to spend $150,000,000 annually for sanitary measures.

WATER SUPPLY AND SEWERAGE.

Our American cities, almost without exception, have provided themselves with an ample water supply and some have spent millions of dollars in order to insure its purity. Difficulty is often experienced, however, in finding a suitable source from which to obtain the constant flow. Ancient Rome provided its citizens with 300 gallons of mountain water per capita, bringing it in over nine massive aqueducts, one of them sixty miles in length. One hundred gallons per capita is nearer the practice of American cities. The amount furnished by Chicago is much more than this, being an average of over 136,000,000 gallons per day during the past year.

Sometimes water can be obtained from wells sunk into extensive beds of gravel, or from artesian wells, tapping subterranean streams perhaps a half a mile beneath the surface; but more frequently some running stream or river is the only available and sufficient source. Out of 165 American cities having more than 15,000 population, 100 take their water supply from rivers, as do also more than 500 of the smaller class of cities. The time is coming when our rivers will be used to a far greater extent than now, as population becomes more dense, and this it is which makes the subject of sewage disposal *the most important sanitary problem of our day*. The action of the air and sunlight upon the water in rivers renders it peculiarly desirable and wholesome, being, as it usually is, much softer than well waters. But when polluted with sewage it can only be viewed with disgust and alarm.

One of the most important discoveries of our own day has been that of the micro-organisms that occasion or accompany contagious diseases, such as cholera, typhoid fever and diphtheria. These germs are found to be wonderfully tenacious of life. No degree of dilution will render water tainted with these germs harmless. Neither heat or cold, or lapse of years, seem to destroy their vitality.

The exclusion of sewage from water courses has, therefore, become a matter for national legislation in European countries, and has been already acted upon by several of our American states. There can be no doubt that our national government will be compelled, as an interstate health measure, to forbid the use of rivers for sewage disposal. Unfortunately there are, at present, a large number of American cities that discharge their sewage into the rivers from which they take their water supply, regardless of the needs of other cities which lie below them upon the same stream. A great reform has, however, commenced, and every year adds to the number of those that have adopted a more decent and sanitary system.

In Europe, the great cities of Berlin and Paris, with hundreds of smaller cities, are successfully solving this problem of sewage disposal by using it for the irrigation of tillable land, or by submitting the crude sewage to chemical and mechanical treatment. The whole trend of modern thought on this subject is in this direction, which not only insures immunity from disease, but also the utilizing of the valuable constituents of the sewage. The costliness of such processes is being reduced, and is not greater than the importance of the subject warrants.

CHICAGO DRAINAGE.

The Chicago Drainage District scheme, which is now being pushed with great energy, is one which demands much more attention from taxpayers than it has yet received. It is an attempt to solve the great question of sewage disposal for all time to come, so far as Chicago is concerned, by reversing the current of the Chicago river and sending the waters of Lake Michigan down the water shed of the Mississippi. The sewage of a city of 1,500,000, 2,000,000 or 2,500,000 is to be discharged into the river, and, mingling with its flow, to be carried away out of sight and out of mind, In the hope of freeing this process from all objectionable features, the channel is to be made very large, so that the sewage will be greatly diluted. Incidentally, the canal across the divide is to be deep enough for navigation by the largest of lake vessels, and it is suggested by its sanguine projectors that in time a like deep channel will be extended to the mouth of the Mississippi River.

At first sight this plan seems to be at variance with the policy which the best engineers of the world are adopting in dealing with similar problems, and it is not strange that many engineers and large numbers of taxpayers are not as yet convinced that the scheme is the best one which could have been adopted. The contamination of the Des Plaines, Illinois and Mississippi rivers at their head waters, for all time to come, by the sewage of what will eventually be the largest city on the Continent, may well be deprecated, especially so when we realize that the cities along these rivers are practically dependent upon river water for their public supplies. It would certainly seem that nothing but the most extreme necessity could justify such a course on the part of this great municipality, and that nothing but the most short-sighted and time-serving policy on the part of the valley towns could permit it.

The construction of such a ship canal for navigation between Lake Michigan and the Mississippi Valley, as has long been contemplated by the United States Government, with its flow of pure Lake Michigan water, would be a great advantage to the future population of the valley, provided all sewage was rigorously excluded from it, as it undoubtedly would be.

The history of this movement from the first has been very remarkable. The Legislature of Illinois, at its last session, actually passed a bill by which the taxpayers of this great district have been made responsible for the cost of *one of the greatest engineering works of this age, and liable for all the damage which must inevitably result from it.* It has done this against the judgment of the distinguished officers of the U. S. Engineer Corps, and even before a detail, specification or estimate had been made of

the work itself, or an estimate of the probable damage that would accrue from changing the regimen of important water courses.

NOT A DITCH ONLY.

I call it one of the greatest engineering undertakings of the age. It is such, for although often spoken of as a ditch or a canal, as though a question merely of earth and rock removal, it is in reality vastly more than this. It is proposed to create an artificial river, of large dimensions, which shall pour its flood unceasingly into the Des Plaines, thence to the Illinois, and thence again into the Mississippi river. The channel of this river is to be excavated deep below the surface of the earth, and below the outlets of its water courses, and a twin Chicago River is to be created through the heart of the city, to supply its flow. The periodical floods of great streams are to be intercepted and controlled by constructing new channels across summits of natural water sheds, and providing and maintaining outlets for them through the shore of Lake Michigan.

Let us compare this work with several of the more important engineering achievements of our times.

The Hoosac Tunnel, built by the State of Massachusetts, after many years of contention and difficulty, cost $13,000,000.

The Eads Jetties cost about $5,000,000.

The Brooklyn Bridge cost about $15,000,000.

The new Croton Aqueduct of New York City, the greatest sanitary work on this Continent, cost about $23,000,000.

The Improvements of the Mississippi River by the U. S. Government have cost $13,000,000.

The entire cost of the Chicago Water Works, to date, including annexed districts, is about $17,000,000.

The entire cost of the sewerage system of Chicago is about $11,000.000.

It is reported that an estimate has been lately made, placing the cost of the canal, alone, at $28,000,000. To see how much such estimates can be relied upon, it is interesting to note that the estimated cost of the Hoosac Tunnel was $3,500,000 as against the $13,000,000 that it did cost. The estimate on the Brooklyn Bridge was $9,000,000 as against $15,000,000. The estimate on the Croton Aqueduct $15,000,000 against $23,000,000 of actual cost.

But the estimate of $28,000,000 does not cover the cost of placing bonds, collecting the tax, paying the interest, buying the land, or satisfying the demands of land owners, whose lands are overflowed. Neither does it include the cost of the new river between the lake and Bridgeport, or that of the great intercepting canals which will certainly be required to regulate the floods of the North Branch and the Des Plaines. Neither does it include the intercepting sewers along the lake, or the pumping works required for discharging the sewage into the new channel.

SOME OBJECTIONS.

Among the objections which are brought against the plan, are such as the following:

1. The certainty that enormous expense is involved.

2. The impossibility of accurately estimating that expense within tens of millions of dollars.

3. The probability that the U. S. Government will ultimately forbid its use, as detrimental to interstate interests.

4. The certainty that it will always be a sore cause of contention between the citizens of Chicago and the valley towns.

5. That litigation, from real or supposed flowage damages, all along the Des Plaines and Illinois rivers, will be an endless source of expense and annoyance to the taxpayers of Chicago, especially so as suits are to be brought in the local courts, and at the expense of the Drainage District.

6. The fact that the tax for its cost must be laid at once upon lands that do not need present relief, and will not for fifty years.

7. That it contemplates the discharge of sewage into the Chicago river as at present, where it will collect upon the bottom and sides of the channel.

8. That it pollutes the great water ways of the state, destroying their value as sources of water supply.

ESSENTIALS.

Let us now consider for a moment the features which are essential, in order to afford adequate relief to this district without detriment to others.

A general sanitary scheme for the sewage disposal of Chicago, ought certainly to include the following:

1st. It should be of such a nature that its ultimate cost could be estimated within say twenty per cent.

2nd. It should not involve costly or continuous litigation.

3rd. It should exclude sewage from all water ways.

4th. It should be capable of application in detail, to limited areas, as demanded from time to time, without inflicting unnecessary expense upon undeveloped portions of the Drainage District.

5th. It should be of such a nature as to admit of unlimited extension, as the growth of the city may require in future years, a growth which cannot be restricted to two and one-half millions of population.

6th. It should give promise of speedy relief in crowded sections of the city, and particularly in view of the emergency of 1893.

7th. No two such incongruous things as a canal for commercial uses and works for sewage disposal should be yoked together, or combined in one tax bill or assessment roll.

That a plan, or that more than one could be formulated upon the lines here laid down, cannot be doubted.

COMPETENT COUNCIL.

Two justly distinguished engineers are now in the employ of the Drainage Commission, but unfortunately they have been called in at too late a stage in the history of the scheme, to be consulted as to its general utility. Their functions, thus far, have related simply to the location of a canal, whose dimensions and flowage were pre-determined. To such men should have been committed the broad and exhaustive consideration of the general problem of the disposal of the Chicago sewage. But so important a matter should not be left entirely to the judgment of American engineers, not because they lack ability, but because of necessity they lack practical experience in dealing with such problems upon a large scale. European engineers, who have had a life-long experience in such matters, and who have successfully solved like difficulties, should be called into council.

If to four of our ablest American engineers there should be joined in council three of the ablest sanitary engineers of England, France and Germany, constituting a Board, whose duty it should be to recommend a general plan for the disposal of Chicago sewage, then, upon their report and recommendation, our taxpayers might be justified in mortgaging their estates to the extent of $50,000,000 or $60,000,000. They could then feel some measure of assurance that the end would be worthy of the sacrifice demanded of them. They would also feel confidence that the ultimate cost of the work would not be materially in excess of the estimates furnished by the Board of Engineers.

But in the absence of such competent authority or advice, how can the course which Chicago has entered upon, be characterized as anything short of suicidal?

To revert to our general subject:

For abuses which cannot be trusted alone to public functionaries or to political parties, and for the solving of sanitary problems which require careful scrutiny and persevering effort, nothing affords a better remedy than the voluntary action of non-political organizations and clubs, willing and able to do work for the public good. That Chicago affords a field for the concerted efforts of many such, seems to be a matter upon which there can be no difference of opinion.

BUFFALO MASTER PLUMBERS.

Edward L. Cook, the progressive sanitary plumber, at 199-201 Pearl street, Buffalo, N. Y., writes us that the following resolution was passed by the Buffalo Master Plumbers' Association on January 28th, 1891: "*Resolved*, That on and after the first day of February, 1891, no member of The Master Plumbers' Association shall submit tenders in Architects' offices for plumbing, drainage and gas-fitting, nor upon Architects' or Superintendents' specifications, nor upon any specified work that is submitted for completion, unless the bids are to be received at a stated time and opened in the presence of the bidders." The resolution is signed by L. P. Beyer, President, and Charles Geiger, Secretary. Mr. Cook informs us that the resolution was passed with but one dissenting vote. The architects of Buffalo generally approve of the plan and it seems to be working very satisfactorily.

AMONG THE PLUMBERS.

The familiar face of J. J. Hamblin was missed at the last meeting of the Chicago Master Plumbers' Association, which has seldom happened since the first meeting of the organization, about ten years ago. We were sorry to learn that the reason of his absence at the last meeting was owing to the illness of Mrs. Hamblin, who has been ill for some time.

Harry Black is meeting the duties of secretary of the Chicago Association in a very able manner, and is endeavoring to get the lukewarm master plumbers out to the meetings of the association. His notices of the meetings are very unique and artificially arranged.

The many friends of Mr. David Whiteford will be sorry to learn of his recent sickness, which now confines him to his home at 372 West Randolph street. Mr. Whiteford, who is president of the Chicago Master Plumbers' Association, was first taken ill on Thursday, the 12th inst., and was compelled to send word to the association at the last moment that he would not be able to attend the evening meeting on that date. His physician hopes to have him able to attend to business within a short time.

R. S. Kirtley, of the popular firm of Kirtley Bros., at 1213 Walnut street, Kansas City, Mo., writes us that the Master Plumbers' Association of that city is in a flourishing condition, and the plumbing business good for this season of the year.

Mr. J. F. Wulf, formerly of the firm of L. Wolff Manufacturing Company, has associated himself with the well-known firm of Robert Rom & Company, of Milwaukee.

National President Robert Griffith desires a letter from every local master plumbers' association in the country, giving a full list of its members, in order that he may make up the records for the coming convention at Cincinnati next June. The National headquarters are at 427 North Clark street, Chicago, Ill., and it is very desirable that each association forward such letter to the president as soon as possible, as it will greatly facilitate the good work he is doing for the master plumbers throughout the country.

J. H. Kilian has moved his place of business to 333 Twenty-second street, and reports business good at his new quarters.

The compliment paid by L. B. Cross to the Chicago Master Plumbers' Association, in his speech before this organization last week, certainly reflects great credit upon its members, since the remarks were uttered by such an able man, and in the most sincere and confidential manner.

Figures are being received from plumbers on the plans for the new Union Depot in Detroit, Mich., in which the "Wayne" closets are specified, which are manufactured by the Detroit Lead Pipe and Sheet Lead Works.

At the next meeting of the Chicago Master Plumbers' Association there will be a special report of the Warehouse Committee, which will be of especial interest to all members of the association. The meeting occurs on Thursday evening, February 26th, and it is desired by the chairman of the committee to have a full attendance at this meeting.

Mr. M. L. Mandable made a very able speech at the last meeting of the Chicago Master Plumbers' Association, advocating united action on the part of the association in getting up a display of sanitary and plumbing specialties.

M. A. Gleason, of the Goodspeed Publishing Company, will compile a history of the plumbing business in Chicago.

Mr. Griffith thinks that the Chicago Master Plumbers' Association should have a banquet, and initiate the new officers in a manner suitable to the dignity of the association.

The convention number of the *Architecture and Building*, published in New York city, is very handsome, and shows great enterprise on the part of the publishers.

Mr. T. C. Boyd thinks that the master plumbers should have an "experience-meeting" every few weeks, which, he thinks, would be of advantage to each and every member of the Chicago Association.

Mr. A. C. Hickey is quite a hustler for business, and has several large contracts for plumbing on hand at present. He is fitting up the opera-houses at Birmingham, Ala., and at Waco, Texas. After finishing this work he will commence operations on a contract for an opera-house in Salt Lake City, and then expects to finish some fine work on the Pacific slope.

The Detroit Lead Pipe and Sheet Lead Works have been compelled, during the last year, to enlarge their plant in order to meet the demands of their rapidly-increasing business. Their former capacity has been more than doubled, and they are now able to accommodate the public with a degree of promptness which has always characterized their business transactions. Their handsome new catalogue for 1891, embracing everything in the plumbing, steam and gas fitting line, can be obtained by writing the secretary, Mr. E. A. Morris, at 57-61 Second street, Detroit, Mich.

TRADE AND BUSINESS NOTES.

Merchant & Co., importers, manufacturers and dealers in metals, of Philadelphia, send us "A Midsummer Night's Dream—Being a Somnambulistic Ramble with Merchant & Co. and Their Friends, the Brownies." It is seldom that such an artistic and unique presentation to the trade as this is made, and we have had to examine and admire it several times, and we find it a clever and satisfactory little book to hand a visitor for his entertainment while we "finish this article." Those acquainted with Palmer Cox and his Brownies—and who is not?—will know in advance how to appreciate this little gem. And another thing, all those interested in metals will find substantial information as well as amusement in the pages of this book. We have here about all kinds of metals, in about all kinds of shapes, and for about all kinds of uses. Those interested in building construction will take a special interest in reviewing these pages, and we are quite sure that the Star Ventilator will attract attention and receive consideration. Roofing-plates, cornice sheet-metal, brass and copper sheets, rolls, tubes, rods, etc., seamless drawn brass and copper tubing, Root's patent spiral riveted pipe, solders, bearings, electrical supplies, etc., etc., are found in the pages of this amusing little volume, and while you are reading the business announcements the Brownies will certainly amuse you with their delightful antics.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago: Cottage Grove avenue, east, between, 39th and Oakland avenue, ten-story apartment building; cost, $500,000. Treat & Foley, architects. Superior street, four-story factory Julius H. Huber, architect. Ashland avenue, four-story building; cost, $15,000. G. Bloedner & Co., architects. Three three-story school buildings will be erected; cost, $70,000 each. Charles Rudolph, architect. F. L. Fry has plans for a three-story residence to be erected on Hermitage avenue. He also has plans for a three-story flat building to be built on Ashland avenue. Also plans for a flat building to be erected on Congress street. Wabash avenue, four-story store and flat building. W. H. Drake, architect. The same architect has plans for remodeling a store corner State and Van Buren streets. Also has plans for remodeling five stores on Clybourn avenue. Dearborn street, near Twenty-fourth, four-story building for the Chicago Medical College; cost, $100,000. S. S. Beman, architect. Same architect has plans for a seven-story warehouse to be erected on South Clinton street; cost, $40,000. Vernon Park place, six three-story flat buildings; cost, $40,000. Treat & Foltz, architects. Chestnut street, four-story flat building. Same architects. Peoria street, three-story building will be erected for the Board of Underwriters. Treat & Foltz, architects. Monroe street, four-story building will be remodeled into an eight-story warehouse. Oliver W. Marble, architect. University place, four-story apartment house; cost, $100,000. Same architect. The same architect will also remodel the Alaska Fur Company's building on State street. He also has plans for a three-story residence to be erected on Grand boulevard; cost, $16,000. Cottage Grove avenue, near Forty-first street, seven-story apartment house; cost, $200,000. Robert Rae, architect. Stony Island avenue, opposite Jackson Park, ten-story hotel; cost, $500,000. Same architect. Sidney avenue, two three-story residences; cost, $15,000. Robert Rae, architect. The same architect has plans for six three-story residences; cost, $40,000.——Grand Rapids, Mich.: Ten-story fire

proof office building will be erected for the Michigan Trust Co.; cost, $300,000. S. S. Beman, Chicago, architect.——Anaheim, Cal.: Two-story residence. Robert Rae, Chicago, architect.——Grand Rapids, Mich.: Corner Bark and Ransom streets, seven three-story houses; cost, $30,000. A. W. Rush & Son, architects.

HEATING AND LIGHTING.

Brooklyn, N. Y.: The Commercial Electric Company (Limited) has been incorporated. The object is to supply electric light and power to Brooklyn. H. Carlton Radford is one of the incorporators.——Livingston, Mont.: An electric light plant is to be established. For particulars address Thomas Ash.——Lincoln, Neb.: Important improvements will be made to the local electric lighting plant. City Clerk Van Duyn can furnish particulars.——Waco, Texas: It is proposed to make extensive improvements to the local lighting system. Address Mayor McCulloch.——Pierre, Dak.: The question of establishing a gas plant at this place is being agitated.——Jamaica Plain, Mass.: The proprietors of the Jamaica Plain Gaslight Company have voted to extend their mains to the adjoining community of West Roxbury.——Belfast, Me.: Important improvements are to be made to the plant of the local lighting company.——La Salle, Ill.: The Marquette Heating and Lighting Company has been incorporated to furnish heat and light. The organizers are Messrs. W. E. Berkenbeurl, J. E. Malone, N. Stranss, W. A. Locke, and others.——Peabody, Mass.: It has been voted to petition the Legislature for authority to establish a town and commercial electric plant. A committee of five was appointed to get counsel and urge the passage of the bill.——Parkersburg, W. Va.: The city council has authorized the city clerk to advertize for proposals for street lighting for a term of from one to five years, and for 70 to 100 lights. The clerk or the mayor can furnish particulars.——Marlboro, Mass.: The Germania Electric Company has been incorporated to manufacture incandescent lamps and electric supplies; capital stock, $250,000.

SEWERAGE NOTES.

Brunswick, Me.: The sewerage plans of Engineer Danforth have been accepted.——Weehawken, N. J: A main sewer will be built in the lower end of the city, into which all other sewers will empty.——Atlanta, Ga.: The city will construct sewers, to cost $90,000. Ordinances for this purpose have been introduced in the city council.——Troy, N. Y.: The public improvement commissioners have elected Palmer C. Ricketts, engineer, and C. D. Baltimore, assistant engineer.——Cordele, Ga.: The city is to have a sewerage system, to cost $10,000.——Waltham, Mass.: Wm. T. Pierce has been appointed engineer-in-charge of the sewerage system. There is to be about thirty-five miles of pipe laid——Orange, Mass.: The Committee on Towns of the Massachusetts House has reported the bill to authorize the town of Orange to incur a debt of $25,000 beyond the debt limit, to construct a system of sewers.——Hyde Park, Mass.: The question of providing for a system of sewerage is under consideration.——Jacksonville, Fla.: The city engineer has been authorized to purchase a four-inch centrifugal pump for the receiving-basin for the disposal of the sewage of the Springfield suburb.——Cleveland, O.: Plans for work to be done during the coming season have been prepared by Mr. Force, city engineer. About twenty-five miles of sewers will be built, including the large one on Walworth street.——Terre Haute, Ind.: One district in the business portion of the city, which has now surface drainage, will have sewers built this year at a cost of $15,000 to $25,000. To complete the sewerage system would require the construction of about four miles of main sewer and four miles of laterals. The main sewer would cost about $200,000.——Oak Park, Ill.: The ordinances for streets, sewers and improvements will appropriate about $1,250,000.——Denver, Colo.: The city engineer, Mr. McIntyre, has submitted plans for the proposed sewer on Delgany street. The estimated cost is $196,039.50.——Braddock, Ohio: The city is adopting a general sewerage system.——Tacoma, Wash.: The city has decided in favor of the proposed issue of $500,000 in bonds for public improvements, including sewer extensions.——Lowell, Mass.: The sewer committee have asked for an appropriation of $75,000.

BIDS AND CONTRACTS.

Kansas City, Mo.: Bids are wanted until March 2d for the substructure and superstructure of new city hall. S. E. Chamberlain, superintendent of buildings.——Millerton, N. Y.: Sealed proposals will be received by the Board of Water Commissioners until 2 o'clock P. M. of February 27, 1891, at their office, for the material and labor required to construct water-works. E. H. Thompson, J. W. Pulver, N. Best, P. N. Paine, Board of Water Commissioners.——Troy, N. Y.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 9th day of March, 1891, for all the labor and materials required for the stone and brick work of the superstructure of the U. S. post-office, court-house, etc., building at Troy, N. Y., in accordance with the drawings and specifications, copies of which may be had on application at this office or the office of the superintendent at Troy, N. Y. Jas. H. Windrim, Supervising Architect.——Dayton, Ohio: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P.M. on the 10th day of March, 1891, for all the labor and materials required for all the joiner's work, wood flooring, hardware, glazing, painting and polishing and marble-work for the U. S. post-office, etc., building at Dayton, Ohio, in accordance with drawings and specifications, copies of which may be had on application at this office, or the office of the superintendent at Dayton, Ohio. James H. Windrim, Supervising Architect.——Washington, D.C.: Sealed proposals will be received until Tuesday, March 10, at 12 o'clock noon, from parties who will agree to erect and lease for a term not exceeding five years, with the privilege of renewal, a building suitable for the temporary use of the Washington city post-office. A general idea of the plans and character of the proposed building will be furnished by the postmaster at Washington, D. C., upon application. Proposals should be indorsed "Proposals for City Post-Office Building," and should be addressed to the Postmaster General, John Wanamaker.——Columbia, S. C.: Bids, accompanied with plans and specifications, for furnishing the city of Columbia with a 3,000,000-capacity pumping station, with all necessary machinery, consisting of pumps, water-wheels, filtering plant, pipe-connections, stopcocks, etc.; also a complete stand-pipe. Bids must include all necessary masonry and earth-work for foundations, including a protecting wall or breakwater, for protection against high water, and will be received by W. J. Cathcart, city clerk, until March 20.——Berryville, Va.: Proposals are wanted until March 2nd, for the construction of a complete system of water-works. Address T. S. Thompson.

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A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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ST. LOUIS is fighting the smoke ordinance. The principal weapon used is a bill before the Municipal Assembly requiring every manufacturer to use a smoke consumer.

THE Sanitary Board of Kansas City has an inspector of plumbing and one assistant, and wants to increase the value of this service by the addition of another assistant. The request is modest enough and should be granted in the interest of public welfare.

OWING to the decrease in natural gas the companies furnishing gas for Indianapolis, Ind., have cut off the supply to all factories for the winter. There seems to be good evidence from all the gas fields that the failure of natural gas is but a question of time.

"PLUMBERS VERSUS THE PEOPLE."

THE *Evening Wisconsin*, having succeeded in working itself up to the speaking point, relieves itself as follows:

"Assemblyman Desmond, who was elected on a platform loudly denouncing governmental paternalism, seems to think that paternalism of that sort is less offensive when exerted over grown people than over children of school age. He has introduced in the Legislature a bill providing that plumbers must pass examination before commissioners appointed by the governor.

"The bill belongs to the class of legislation which Bob Ingersoll cleverly satirized when he said, 'An American citizen does not need to have a policeman sent around with him to protect him from buying eleven eggs for a dozen.' It is evidently drawn not so much for the purpose of meeting a public need as for the purpose of providing fat offices for Democrats and helping individuals in the plumbing trade who are jealous of business competition and desire to discourage it as much as possible. There is absolutely no excuse for the passage of Mr. Desmond's bill. The matter is one in which state intervention is sure to do more harm than good, so far as the public are concerned. All the desirable objects which such a measure could claim to affect are better accomplished by local enterprise, as in Milwaukee, where an official inspector subjects all plumbing to inspection and tests and condemns such as does not comply with specified requirements.

But this system, while it secures sanitary plumbing for the citizen, does not prevent him from enjoying the benefits of free competition in the plumbing business. Having tried in vain to effect by appeals to the council the substitution for Milwaukee's admirable inspection system of an examination and license system such as that provided for in Mr. Desmond's bill, the schemers who are desirous of limiting competition in the plumbing trade are now trying to accomplish their purpose with the aid of the Legislature."

There is evidently something wrong with the editorial liver or head of the *Evening Wisconsin*, and it would better take something for it immediately. We are not acquainted with Assemblyman Desmond, but will lay two to one that he is a broader, better and more useful citizen than is the writer of the above. There is no paternalism in the bill whatever, and such a charge from the *Evening Wisconsin* shows that it does not know what paternalism is or that it is not acquainted with the provisions of the bill.

If one will look closely at this subject of examinations as a test of competency, we will find that, directly or indirectly, all persons, at whatever work engaged, are examined as to their competency to perform the services required of them, and their employment depends on their fitness to perform such labors. If a carpenter, blacksmith, clerk, book keeper, farm laborer, or any other person be employed, the employer examines him very thoroughly during his first services, and if he be found incompetent, he is dismissed. This we find when services are rendered in a private capacity. When the services to be rendered are of a public nature, and are of such a character as to affect public interests, this personal examination is no longer available and recourse must be had to legal and official agencies. Thus we find provisions for the examination or licensing of doctors, teachers, lawyers, government employes, etc. Is this paternalism in the sense in which the *Evening Wisconsin* speaks?

The lawyer has to do with the property of the people, the doctor with health and life, and the plumber with all three, and his competency should be the subject of as close scrutiny as that of the other two. The most advanced sanitarians, health officers and intelligent people generally, recognize in the plumber an agency for much good or harm as regards the public health—the highest interest that can be served—and it is highly important that he should be qualified to render the best service possible. As important as is health so important is the work of the plumber, and no incompetent workman should be allowed to endanger the health and happiness of the people. Any one at all informed knows this, and what better method is there for determining the qualifications of a plumber than an examination?

The bill, as will be seen by referring to another column in this issue, does not add any expense to the people. This public service is paid for entirely by the master plumbers, and the good of it results to the people; and yet a paper can be found so foolish and so blindly partisan as to denounce it. That same paper will denounce bad plumbing and name plumbers as robbers, and yet when the plumbers ask for legal assistance in procuring efficient workmanship, it opposes them because it, in its partisan littleness, fears it will make "offices for Democrats." Here is seen the animus of the opposition, and even that is imaginary and born of party radicalism. The trouble with the *Evening Wisconsin* is

its own plumbing is out of repair, and its political cesspool needs to be replaced by a well ventilated sewer with an automatic flush tank.

NOTES AND NEWS.

One sheet of paper recently made was eight feet wide and seven and three-quarters miles long.

Lead in the United States amounted in 1890 to 187,000 tons of 2,000 pounds, or a little less than in 1880.

At present some 1,500 tons of phosphorus are used every year, and chiefly in the manufacture of matches.

The production of copper in the United States in 1890 amounted to 278,610,000 pounds, far exceeding any previous record.

Gum arabic, which was once universally used, has become very scarce and dear, and a substitute for it is being made from starch.

There are few, if any, patents on surgical instruments. When a physician gets up some new device he does not obtain a patent on it, but anyone is free to make it, and the profession secures the benefit of it.

To find the pressure in pounds per square inch in a column of water, multiply the height of the column in feet by .434. Approximately, every foot of elevation is called equal to one-half pound per square inch.

The shipments of tin from the Banca and Billeton islands, off the cost of Java, and from which the Netherlands India derive a considerable income, exceeded 9,000 tons last year, says the Indian *Engineer*. The production of Banca showed a falling off, however, as compared with previous years.

According to the Buffalo (N. Y.) *Courier*, an act intended to regulate the practice of architecture, in which nearly all the local architects are interested, is now pending in the Legislature. It was introduced at the request of the State Association of Architects, and provides for the appointment of seven persons to constitute the State Board of Architects. The board may adopt rules and regulations for the examination and licensing of applicants for license to practice architecture in accordance with the provisions of the act, and may amend, modify and repeal such rules and regulations from time to time.

In the sixth annual report of the State Board of Health, of Maine, advance sheets of which are before us, attention is called to "House Bill No. 27, an act to provide for the registration of vital statistics," a bill which the last legislative body referred to the 65th Legislature. This bill was prepared by the State Board of Health after an extended examination of the existing laws of other states, and another effort is now to be made to secure its passage. It seems almost needless to point out the value of such a bill. An official registration of births, marriages and deaths, in such a form as to make it furnish facts available and valuable for various purposes, is considered so important work that most civilized states and nations have not omitted to provide for it. Vital statistics, when properly collected and recorded, are invaluable for a variety of purposes which will readily suggest themselves, and it is, therefore, somewhat remarkable that the state of Maine should have thus far neglected to properly provide for their registration. It is to be hoped, however, that its need will shortly meet with a due share of recognition.

It is remarkable to what an extent wire and wire rope are displacing hemp and cotton ropes, once so much in vogue, remarked a prominent Washington hardware merchant to a reporter. "This will be noticed right in the homes as well as in the workshops and large business buildings. It is not so very long ago that the majority of beds were corded, while now days they are provided with mattresses. Not only this, but there are now manufactured wire pillows, wire bolsters and wire upholstry lining, all of which meet with large and increasing sale. One reason for the growth in popularity of the innovation lies in the fact that wire offers no ground for vermin or disease germs. The medical profession greatly favor its use both in hospitals and dwellings. The same may be said of the use of wire for clothes-lines. Some years ago it was discovered that the old fashioned ropes harbored minute life, and in some instances were infected with the germs of malignant diseases. This caused a rush for wire clothes-lines. It is said that in 1860 there was not a yard of it in use, while now there are thousands of miles employed. You have, perhaps, noticed how the sash cords of your windows have a faculty of giving out occasionally. This is due more from the ravages of decay and minute insects than by actual wear from usage. The advantage of substituting flat brass or copper chain for the old style sash cord is now recognized by all the leading architects, as you will observe by examining the better class of new buildings.—Washington *Post*.

THE FILTRATION OF NATURAL WATERS.*

In the study of the subject of the filtration of water for drinking purposes, we shall arrive at no clear and valuable ideas unless we distinguish sharply between mechanical filtration, which deals only with the interception and retention in the filter of the solid particles suspended in the water, and filtration combined with the oxidation of organic matter—that in solution, as well as that in suspension in the water. This latter process—the purification of the water by the oxidation of its organic contents—can be accomplished only by intermittent filtration, the former—the mere removal of the solid particles in the water—may be accomplished by continuous filtration, as practiced in many large cities in Europe.

When we speak of the purification of water by filtration, we mean in a general way, that a water is thereby rendered fit to drink which was unfit or unattractive before it was filtered.. The change effected by filtration may be simply the removal of vegetable or earthy matters, whereby the water is made more palatable and more attractive in appearance, or it may be more radical in converting water which was positively harmful into a good drinking water. Widely different in action as are the two systems of filtration, the intermittent and the continuous, yet it is possible by both systems to improve the quality of a bad water.

In the system of continuous filtration, in which there is little or no change made in the dissolved organic matter, it might, at first thought, seem as if there could only be imperfect purification; but it must be borne in mind that it is possible in this system to remove in great part even those very minute organisms, the bacteria.

The germ theory of disease furnishes us with the simplest explanation of the way in which water does harm, and if we can, by simple mechanical filtration, remove the harmful germs from the water, we have effected a true and efficient purification of that water, whatever may be its chemical composition. Let us push this idea a little further. If we take as the basis of our theory of harmfulness of water that disease is caused by it only when micro-organisms are present in it, then, if we could by the continuous filtration of sewage remove absolutely all the germs which it contained, leaving unchanged its other characters—appearance, taste, odor, etc.—this sewage would be perfectly safe to drink. To put the matter in another form, a sterilized water or sewage has no possibilities of producing disease except so far as it may contain saline or other substances which may produce derangements of the system in the same way as would a drug—a dose of salts or of senna. It is foreign to my present purpose to consider whether our knowledge at present justifies this position, but it is important to bear it in mind in judging of the efficiency of filtration.

When water is said to be well, or moderately well, or completely purified by filtration, we cannot know what is meant unless we know what is the standard of purity implied. Is it simply the removal of color, odor and suspended matter; is it chemical purity, meaning thereby the absence of unoxidized organic matter; or is it bacterial purity, or freedom from germs? Again, what shall we say of water of high chemical purity, with high bacterial contents; or what of a water with few or no bacteria which contains considerable organic matter capable of undergoing change?

Intermittent filtration is capable of giving water free from organic matter and free from germs; continuous filtration, if conducted very slowly, is capable of giving water free from bacteria, without odor and color, but which may contain much dissolved organic matter. Intermittent filtration affects the oxidation of the

*By Thomas M. Drown, Member Boston Society Civil Engineers, from the Journal of the Association of Engineering Societies.

organic matter in solution as well as that in suspension; continuous filtration has little or no effect on the organic matter in solution.

After laying such stress on the removal from water of bacteria, it sounds like a paradox to say that purification both by intermittent and continuous filtration depends on the presence in the filter of bacteria in enormous number, and that without them the purification would in both cases be impossible.

The idea is not a new one that the bacteria of decomposition are benign and useful organisms which break up organic matter, rearrange its atoms and convert it into mineral matter so that it may again serve as food for plants. If we keep away the bacteria from a mass of dead organic matter it undergoes no change whatever. All processes of decay of organic matter are absolutely dependent on the presence of these micro-organisms, which, so far as we know, have no other than a beneficent role to play in nature. I say this is now a matter of common knowledge and one is, therefore, not unprepared to hear, that in the purification of water by intermittent filtration the ground or sand upon which the water is poured is full of bacteria, in fact, that it is the design of the process to cultivate them and have as many of the micro-organisms in a cubic inch of ground as possible.

If one pours over a column of clean, bright sand, free from bacteria, impure water, as sewage, it will flow out about as bad as it entered the sand. But if it is poured over a column of sand in which septic bacteria has been cultivated, so that the sand may be said to be fairly reeking with bacteria by the million, the water may flow out as pure (organically) as spring water. But even in continuous filtration, where there is little or no oxidation going on the bacteria are, according to Piefke (the engineer of the Berlin water-works), the efficient agents in removing the suspended matters, including the micro-organisms in the water. To this subject we will return later; let us first briefly study the nature of oxidizing or intermittent filtration on the typical polluted water, namely sewage.

Sewage is a substance which contains all of its nitrogen in the unoxidized form. Its principal ingredient is free ammonia; it also contains considerable (but a much less amount, usually) organic nitrogen, or albuminoid ammonia, but of nitrous or nitric acid it contains none. When sewage is exposed to the air in mass, oxidation goes on very slowly, because it can only get air from its surface; when it flows out into streams, the oxygen dissolved in the water of the streams quickly oxidizes the ammonia, and we find in the water a short distance below the entrance of the sewage, nitrites and nitrates abundantly. When the sewage is exposed to the air in very thin layers, as when a porous material like sand is moistened with it, oxidation goes on with great rapidity. It was, until recently, considered that this oxidation was a direct chemical combination of the elements of the organic matter with the oxygen in the air, or the oxygen dissolved in the water, but we now know that nitrogen is not oxidized by the direct contact of decomposing nitrogenous matters with air, unless bacteria are present, and the inference seems a fair one that the greater the number of bacteria the more rapid the process of oxidation. Sewage itself usually contains hundreds of thousands of bacteria to the cubic centimeter which are dormant until air gets access to it. If sewage is preserved out of contact of air, the bacteria of decomposition will in time all die.

(To be continued.)

SINS OF THE CHIMNEY.

In an economic and sanitary sense the best methods of utilizing fuel, and the science of abating the nuisance of its smoke, are questions of immediate and increasing importance.

As a rule, and that with but few exceptions, the homes of the majority of our population, and the accessories consequent in civilization and comfort to the vitalities of our industrial life, are grouped in the centers, where the use of fuel is more abundant and the nuisance of smoke the most intolerable.

Civilization centers in our cities. Education, refinement and all the modern adjuncts of the nineteenth century are in the radius of the circle, where the hum of industry is the daily music, and the landscape divides the honors of hill and dale with the steam of the locomotive and the long red columns of the factory chimney. As our industrial life has grown and our cities expanded and the avenues of human homes have crept into the suburbs and overlapped our urban districts, lengthened the street car line and stretched the electric wire, and human beings by the thousand live, move and have their being in the great cobweb of houses and shops; the laws of health and of morals consequent to fresh air and unabated sunlight have forced themselves on the attention of all who can see fatality in a bad atmosphere, and a compound of death and the devil in the amalgamation of sewer gas and soot. The subtile but unavoidable law that makes cleanliness and contentment the two halves of a unit is so emphatic and pronounced that the wisest men of science and the purest of morals are agreed on the announcement that the surest way to progress and social peace is via the royal highway of cleanliness, pure air and elbow room for the masses.

No normal type of man could flourish in a sewer, and no civilization make headway where soap is scarce and impure air inflating the human lung. Crime, like a maggot, has ever fattened on such impurities, and the omnious discontent of the present age is the most intense where sanitary laws are the least regarded. On the line of this indisputable verity, civilization constructs its sewers, regulates the sanitary conditions of school houses and prisons, and, as a continuance of the same good work, has started the crusade against the chimney.

On both sides of the Atlantic the problem of more heat and less smoke has become a pressing question. Economy in the production of motive power is absolutely necessary to meet the exigencies of industry and the competitions of commerce, and the most scientific methods of utilizing fuel have become an indispensable factor in the success of most modern industries.

In Chicago the matter has attracted the greatest attention, and municipal legislation is making vigorous moves in the direction of abating the nuisance of smoke. A recent report of the Inspector of the Health Department places the number of complaints from April to October of the year 1890 at 2,183. Of this total 493 abated the nuisance, 227 were fined, and 153 cases dismissed on payment of costs.

In the Industrial centers of England and Scotland public meeting, have been held to support the action of the national committee appointed to test the smoke preventing methods and appliances. The result of this agitation it is not difficult to forecast. Ingenuity and science will meet the emergency. The waste attending the present methods of using coal will eventually be corrected and a rebate be made on the profits of a business that throws away so much of its margins in the smoke that darkens the sky and poisons both vegetation and humanity. Remedies are numerous, all with more or less of pretense to utility, and all graded to the score of success or failure.—*Age of Steel.*

STREET-CLEANING IN PARIS.

It takes an army, almost, to clean, scrub, sweep and sprinkle the streets of Paris. The army of street-sweepers is composed of embrigades and voluntaries. The former are considered as cantonniers, or road-laborers, and are employod the whole day long. All the cares of public street-cleaning fall to their lot, and they do the supplementary sweeping, washing out of gutters, cleaning of public stations, market-houses, etc. The voluntaries are voluntary workers. They are enrolled in brigades. There are about 130 of these brigades, and each comprises a chief, a foreman and about thirty men and women sweepers, the greater part of whom only work in the early morning, either in the cleansing of streets, properly, so called, or in assisting to load the wagons that carry away the refuse. They leave off work at 10 o'clock in the morning, and this is called working by the half-day. The labor begins at 3 o'clock in summer and 4 in winter, and when they work a whole day they finish at 4 o'clock—that is to say, after laboring for twelve hours.

The complete service of sweepers comprises thirty-seven chiefs or overseers, 152 foremen, 654 ordinary cantonniers, 2,000 auxiliary sweepers, and 850 men and women who do only half a day's work. Overseers, foremen and ordinary cantonniers are paid monthly—the first 150 to 160 francs, the second 120 to 125 francs, the third 106 francs, and the sweepers are paid, for the work they do, from 64 to 75 cents a day, and 43 to 50 cents for half a day. Out of these small emoluments each cantonnier, no matter what his grade or class, has to pay monthly into a saving bank the sum of five

francs, a reserve fund which is remitted to them, however, immediately they leave the service, or it is paid to their widow, children or other heirs if they die in the harness. A further reduction of two francs for the society of mutual succor is made monthly from the wages of those employed in the Bois de Boulogne and in the Bois de Vincennes.

The implements used are of two sorts, according to the sex of workers and place of combat. Women sweepers handle the ordinary birch broom, or what is known as the "piazzava," made of a sort of vegetable hair of great suppleness and much resistance. Road-scrapers are also larger brooms with which to push the water and mud toward the sewer-opening, and experienced drivers are supplied with sweeping-machines. These scrapers and brooms are worth describing, particularly those used along the gutters and on the bitumen and wooden pavements. They have India-rubber bands. This produces perfect adherence, and there is no space between implement and ground that is to be cleaned, so that water and mud are easily pushed into the sewer. Mechanical sweepers are a cleaning-machine of recent invention, and they are endowed with great power.

The annual appropriation for this cleaning and sprinkling, as well as the clearing away of snow and ice, is close to 6,815,000 francs. The sweeping service calls for a total of 5,750,000, and the sprinkling department takes the rest—rather high figures. The city raises its share of this fund by a sweeping tax imposed on house-owners. By the terms of the law, the tariff of this tax has to be revised every five years. The last revised tariff was applied in 1889, and it will remain in force until 1893. It produces 2,956,000 francs, to which must be added the amounts owed by the State and Seine Department as their share of the cost of sweeping. The house-owner tax is 14 cents, 10 cents and 4 cents, according to circumstances. Some only pay four centimes—less than a cent—for each superficial meter of land, the maintenance of which is incumbent. As for the sprinkling, that costs 1,000,000 francs annually, the amount being made up as follows: Carts, 500,000 francs; wages, 300,000; purchase of material, etc., 160,000; sundry expenses, 50,000.

AN OLD PLUMBING ORDINANCE.

We are indebted, says the *Metal Worker*, to J. W. Hughes, of Montreal, for a copy of an interesting old ordinance concerning the rights and duties of plumbers in the early days of England. The plumbing craft can trace a trade discount through many centuries, and however far into the future the world endures there will probably be plenty of plumbers living at the last day. The ordinance was put in force in the year 1365, during the reign of Edward III. It was originally written in Norman French and reads as follows in translation:

May it please the honorable men and wise, the mayor, recorder and aldermen, of the city of London to grant unto the plumbers of the same city the points that here follow,—in the first place—that no one of the trade of plumbers shall meddle with works touching such trade in the said city, or take house or apprentices or other workmen in the same, if he be not made free of the city; and that by assent of the best and most skilled men in the said trade testifying that he knows how well and lawfully to work and to do his work, that so the said trade may not be scandalized or the commonalty damaged and deceived, by folks who do not know their trade. Also, that no one of the said trade shall take an apprentice for less than seven years, and that he shall have him enrolled within the first year, and at the end of his term shall make him take up his freedom, according to the usage of the said city.

Also, that every one of the trade shall do his work well and lawfully, and shall use lawful weights as well in selling as in buying without any deceit or evil intent against anyone; and that for working a clove of lead for gutters, or for roofs of houses, he shall only take one halfpenny; and for working a clove for furnaces, tappe troghes, belfreys and conduit pipes, one penny; and for the waste of a wey of lead when newly molten, two cloves as has been the usage heretofore.*

Also, that no one for any singular profit shall engross lead coming to the said city for sale to the damage of the commonalty; but that all persons of the said trade, as well poor as rich, who may wish, shall be partners therein at their desire. And that no one himself or by another, shall buy old lead that is on sale, or shall be, within the said city or without, to sell it again to the folks of the said trade, and enhance the price of lead to the damage of all the commonalty.

Also, that no one of the said trade shall buy stripped lead of the assistants to tilers, laggers or masons, or of women who cannot find warranthy for the same. And if any one shall do so himself or by his servants, or if any one of them shall be found stealing lead, tin or nails in the place where he works, he shall be ousted from the said trade forever, at the will and ordinance of the good folks of such trade.

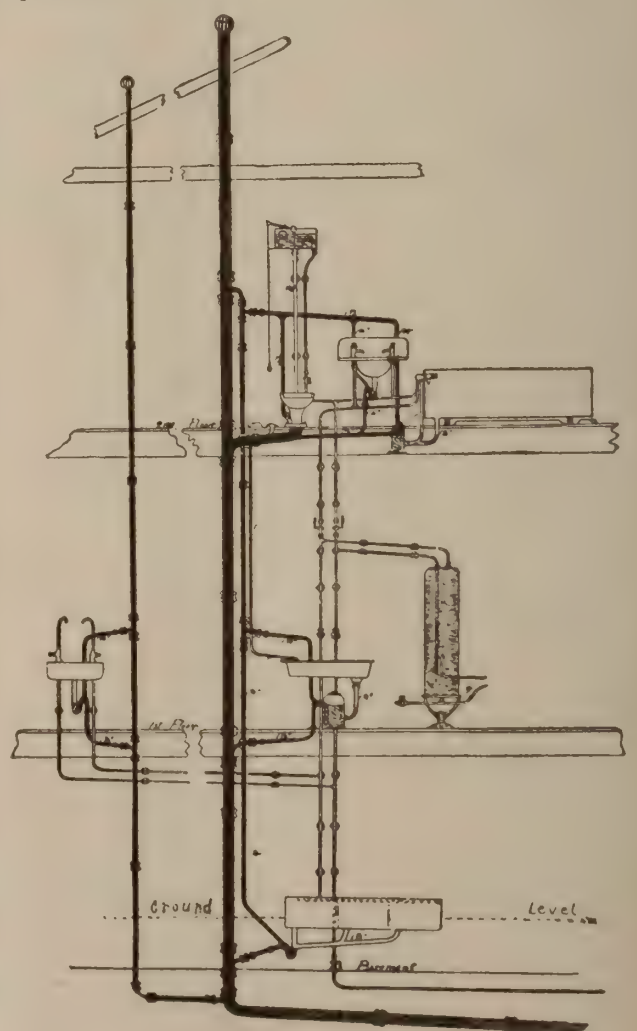
Also, that no one of the said trade shall oust another from his work, undertaken or begun, or shall take away his customers or employes, to his damage by enticement through carpenters, masons, tilers, or other persons, as he would answer for the damage so inflicted by good consideration of the masters of said trade.

And if any one shall be found guilty under any one of the articles aforesaid, let him pay to the chamber of the Guildhall in London, for the first offense, 40 pence, for the second half a mark, for the third 20 shillings, and for the fourth 10 pounds or else forsware the trade.'

*Probably about 140 pounds in 180; but the weights, clove and wey are varying.

PLUMBING RULES AT DALLAS, TEXAS.

In response to a request, Mr. Thomas Henderson, Plumbing Inspector of Dallas, Texas, kindly sent us the following drawing, illustrating the system of plumbing in that city, exemplifying the rules and regulations following. Accompanying the cut here produced were drawings setting forth the detail of sewer joints, drum trap, grease trap, sewers and vents for closets in outhouses, etc., showing that Mr. Henderson has the true spirit of his profession.



The following rules for plumbers, prepared by D. A. Paynor, city engineer of Dallas, Tex., have been approved of by the Dallas City Council.

1. House drains within, and to a distance of five feet outside of, the exterior wall of a building shall be of extra heavy cast-iron pipe, at least ¼ of an inch thick, and not less than four inches in diameter, laid in trenches of uniform grade, suspended to the flooring timbers by strong iron hangers, or fastened to the wall by strong iron hooks. They shall have a grade of not less than one in fifty toward the sewer; changes in direction shall be made with regular fittings, and connections with horizontal pipes shall be made with Y branches and Sanitary T's.

2. All soil pipes in buildings must be extra heavy cast-iron, and extend up to and above the highest fixture, from which point standard pipe may be used to extend through the roof.

3. All joints shall be packed with picked oakum and run with molten lead, thoroughly calked and made tight.

4. All soil and vent pipes must be extended at least two feet above the highest point on the roof. The vent pipes may, in case of no independent ventilation pipe, connect into the soil pipe at least three feet above the highest fixture.

5. Connections of lead pipes with iron pipes shall be made with brass or combination iron and lead ferrules, or brass solder nipples connected to the lead pipe by properly wiped solder joints and calked or screwed to the iron pipe.

6. All water-closet traps or bends, when placed between ceiling and floor, must be made of not less than six pound lead to the square foot. All smaller traps placed between ceiling and floor must be made of not less than five pound lead to the square foot.

7. Vent pipes must not terminate or be lead through chimney flues. They must be carried up inside the house when practicable.

8. All traps shall be protected from syphonage or air pressure by special air pipes of the following sizes:

9. All water-closet traps shall be back-vented with not less than 2-inch pipe for 30 feet or less, and not less than 3-inch pipe beyond the 30 feet. When there is but one closet and the trap is set not less than two feet from the vertical line of the soil pipe, 1½-inch pipe may be used. When there is a group of from three to five water-closets, the vent must be 3 inches for thirty feet, and 4 inches beyond. When there are more than five water-closets the vent must be the same as the soil pipe.

10. Vent pipes from all fixtures except water-closets shall not be of less size than 1¼-inch, and when more than one fixture connects into one vent, then such vent shall not be less than 1½-inch pipe.

11. Trap vents from two or more fixtures must be connected at least one foot above the top of the fixtures.

12. All connections to vent pipe must be made of lead; each vent shall have a trap screw wiped into it, not more than six inches above the connection with the trap. The trap screw can be dispensed with if the back vent is connected to trap with a brass coupling.

13. Galvanized or black wrought iron pipes, cast iron soil pipe or lead pipe may be used for ventilation.

14. In no case will a wrought iron pipe be used for a waste for any fixture.

15. All vent pipes shall be run as direct as possible, and 45-degree L's must be used at all times when practicable.

16. No soil, drain or vent pipes shall be covered from view or concealed until after the work has been tested, examined and approved by the city engineer or his agent, and the city engineer shall be notified by the plumber when the work is ready for inspection, and said plumber shall prepare the whole system of plumbing in such buildings for the inspector to make the proper test of same by filling the pipes with water, or applying an air pressure of five pounds to the square inch.

17. Every water-closet or group of water-closets on the same floor shall be supplied from a separate tank or cistern, and no flush for the same shall be less than 1¼-inch pipe. Pan or long hopper closets, or closets that have an unventilated space, or whose walls are not flushed at each discharge, shall not be used.

18. Waste pipes from bath tubs must be connected to a drum trap with trap screw not less than three inches in diameter, wiped into safe, as shown on drawing in engineer's office.

19. Waste pipes from kitchen sinks or any hotel, or other public cooking establishment, and every dwelling house, shall run separate to a grease trap, placed as near the sink as practicable.

20. Grease traps shall be constructed of cement, earthenware or brick, and not less than twenty inches in diameter when placed outside the building. If placed under the sink they must be made of cast iron or lead, with an air-tight screw, not less than four inches in diameter for cleaning. All grease traps must be approved by the city engineer or his agent.

21. Waste pipes from all fixtures shall be of lead or cast-iron, and of the following sizes: Bath tubs, 1½-inch; laundry tubs, 1½-inch; urinals, 1½-inch; wash basins, 1¼-inch; slop-hoppers, 2-inch.

22. All fixtures above the first floor must have a lead safe of not less than three pounds per square foot.

23. No safe shall have a smaller waste pipe than one inch, and where there is more than one safe the size of the waste must be increased in proportion.

24. All safe wastes must have a strong brass strainer over the end of the pipe and soldered to safe.

25. Drip or overflow pipes from safes under water-closets and other fixtures, or from tanks or cisterns, shall in no case be connected directly to the drainage system, but shall be run to some open place in plain sight. If they are run to the outside of the building they must be provided with safe waste valves.

26. Waste pipes from refrigerators, or other receptacles in which provisions are stored, shall not be connected directly with the drainage system, but shall be so arranged to waste on an open tray in plain sight below the refrigerator. This tray may be connected with the drainage system upon being properly trapped like any other fixtures.

27. No sediment from boilers or drain tubes from stop and waste cocks shall be connected directly with any waste or sewer.

28. Rain water pipes shall not be connected directly with the sewer system, except when expressly authorized by the city engineer in writing. When sizes are given for pipes, such sizes refer to the inner or clear diameter of the pipe.

29. If soil or waste pipes are placed in the building for future use, the necessary ventilation or waste pipe must be put in, and the work inspected and tested as if for immediate use. All openings not in use must be closed by screw plugs or calked in.

30. Each sewer connection with laterals must have one cast-iron pipe for ventilation, not less than four inches in diameter, carried not less than two feet above thereof of business, dwelling or out-houses, except when out-house is not less than twenty-five feet from the main building, in which case ventilating pipe must be attached to main building and carried above the roof as shown on drawing in engineer's office. All ventilating pipes must be covered with wire screens.

31. All water pipes from the "T" or "L" in main riser to fixture must be of extra strong lead pipe, and have a lever handle stop cock as near the said "T" or "L" as possible.

32. All water and other pipes passing through safes must be of lead and wiped into safe.

PLUMBING MATERIAL.

CLEVELAND, Ohio, Feb. 16, 1891. Editor THE SANITARY NEWS: I have been been watching with considerable interest the articles by "W. A. K." on ventilation, and it has been pretty thoroughly discussed by him and others. I am anxious to have another matter taken up although it is more general in its nature, viz: "Why is it there are so many inferior goods used in the construction of our plumbing in this city? (and I presume the same is true in other cities). I have been in a position to watch this matter for several years, and it seems that the disposition is, not how good material can be had to be put in our houses, but how cheap; and it has come to such a state of affairs that the manufacturers of first-class goods are nearly driven out of the market by the cheap trash that is being made and sold.

It is really surprising that people will build fine residences, costing from $5,000 to $20,000, and allow so much of the cheap stuff to be put into the plumbing work. I do not mean by this any particular article, for it is true from the smallest article used to the most expensive. It seems that when people want to cut down the price of their house, the plumbing is first to suffer, when it should be the last. I would like some of the readers of your paper to give some remedy for this state of affairs or why they

exist. Is it the jobber, architect, plumber or people themselves, or is it the lack of education along this line? I have more to write on this subject but will wait to hear from some of your readers. F.

HYMN TO THE PLUMBER.

The plumber is ever remembered. Even the rhymer calls him up in fancy; and the following, floating about, has been trapped as an example:

Sweet man, so cool, so calm, so bright,
Owner of earth and sky,
I fear it's going to freeze to-night—
I see it in your eye.

That glitter, that enchanting gleam,
Bespeaks your own sweet trust,
And pipes for water, gas, and steam,
I know that they will bust.

Great man! Some fourteen days ago
My sink-pipe sprang a-leak;
You came and looked and found it so—
And yet, within a week,

You sent two men to look again;
They came and saw and went,
And came again, and stopped, and then
They stopped the open vent.

Your bill therefor, great man, is here—
By special post it came;
And I resign whate'er was mine
To help to pay the same.

How could the world move on its way
Of your great grasp bereft?
We know, however cold the day,
You're never, never left.

PLUMBING LAW FOR WISCONSIN.

The following bill to prevent incompetent persons from conducting the business of plumbing or drain laying in cities having a population of one hundred thousand or more, and providing for a board of commissioners to regulate and enforce the same, has been introduced by Assemblyman Desmond, by request, in the Wisconsin Legislature, read first and second times and referred to the Milwaukee delegation:

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. No person or persons, firm or corporation, engaged in the plumbing or drain laying business in any city in this state having a population of one hundred thousand inhabitants, or more, according to the last general United States census, shall employ as workmen in said business any person or persons except those qualified to work as registered plumbers or drain layers, and no person shall be qualified to work as registered plumber or drain layer unless he shall have made application to and received from the State Board of Commissioners of Practical Plumbing a certificate of competency, and shall have complied with the provisions of this act; provided, however, that any person, persons, firm or corporation engaged in the plumbing or drain laying business as aforesaid may employ as such workmen, apprentices or helpers who may not be registered plumbers or drain layers, not exceeding in number one such apprentice or helper for each registered plumber or drain layer employed.

Section 2. No person, persons, firm or corporation shall conduct, work at or engage in the plumbing or drain laying business in any city in this state having a population of one hundred thousand inhabitants or more, according to the last general United States census, unless such person or persons, at least one member of such firm or one of the general officers of such corporation, shall be registered plumbers or drain layers, or shall employ and place in charge of said business a person who shall be a registered plumber or drain layer, within the full meaning of this act; provided, however, that the provisions of this section shall not apply to such apprentices or helpers as shall be employed under the preceding section of this act.

Section 3. The Governor shall, on or before the first day of May, 1891, and biennially thereafter, appoint five persons who shall constitute a board of commissioners which shall be known and designated as "The State Board of Commissioners of Practical Plumbing," and who shall be selected as follows: Three persons who are practical and skilled plumbers in any city of this state having a population of one hundred thousand inhabitants or more according to the last general United States census; any commissioner of health or member of the board of health of any such city, and a member of the State Board of Health from the state at large, whose duty it shall be to faithfully and impartially execute or cause to be executed, all the provisions and requirements of this act. The said commissioner shall, upon application, and in such manner and at such time and place as they may determine, provided said place of examination shall be within the limits of a city of this state having a population of one hundred thousand inhabitants or more, according to the last general United States census, examine each and every person who shall desire to conduct, work at or engage in the plumbing or drain laying business touching his competency and qualifications, and upon being satisfied that the person so examined is competent and qualified to work at or engage in said business, they or any three of them, upon payment by the applicant of the fees hereinafter provided for, shall grant such person a certificate of competency, under the provisions of this act, and register him in their books either as a practical plumber, or as a practical drain layer, as the case may be, which shall operate as full authority to him to conduct, work at or engage in the said plumbing or drain laying business for the period of one year thereafter; provided, however, that no person who may be registered as a practical drain layer shall conduct, work at or engage in the business of plumbing without having first applied for and received from said commissioners a certificate of competency and be registered on their books as a practical plumber.

Section 4. The commissioners appointed under this act shall hold their several offices for the period of two years, commencing on the first day of May next succeeding the date of the passage of this act, and thereafter until their successors have been appointed and qualified; said commissioners shall within thirty days after notification of their appointment, each subscribe to an oath before the clerk of any circuit court within this state, to impartially and faithfully discharge the duties prescribed by this act; a failure to so qualify on the part of any appointee within the time and in the manner named shall create a vacancy, and all vacancies which may occur in said board either by failure to qualify, death, resignation or otherwise, shall be immediately filled by the Governor from among the classes of persons hereinbefore named as in cases of original appointments.

Section 5. The said board of commissioners shall demand and receive from each applicant for a certificate of competency whom they shall examine and pass, the sum of three dollars at the time of the issuance of said certificate, and every registered plumber or drain layer who desires to continue in said plumbing or drain laying business, shall annually during the time he shall continue in such business pay to said board a registration fee, the amount of which shall be fixed by the board, and which in no case shall exceed two dollars, in return for which he shall receive a renewal of said registration for the period of one year; provided, that no person who shall be actually engaged in or working at the plumbing or drain laying business at the time of the passage of this act shall be required to make application for such certificate of competency for the period of one year commencing with the first day of May next succeeding the date of the passage of this act.

Section 6. The members of said board of commissioners of practical plumbing shall each receive the sum of five dollars for each day actually engaged in such service, and all legitimate and necessary expenses incurred in attending the meetings of said board. Said expenses shall be paid from fees received by said board under the provisions of this act, and no part of the salary or other expenses of said board shall be paid out of the public treasury. All moneys received by said board in excess of said allowances and other expenses hereinbefore provided for, shall be held by said board as a special fund for meeting its expenses. The said board shall in its annual report to the governor

render an account of all moneys received and disbursed pursuant to this act.

Section 7. The said board of commissioners are hereby empowered to make such rules and regulations from time to time for the proper execution of the provisions of this act as in their judgment they may deem necessary and requisite; and shall be required to make a report of the condition of the board to the Governor annually on or before the first day of February.

Section 8. Any person, persons, firm or corporation who shall conduct, engage in or work at the plumbing or drain laying business in any city in this state having a population of one hundred thousand inhabitants or more, according to the last general United States census, without first complying with, or who shall violate any of the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by imprisonment in the county jail not exceeding six months, or by fine not exceeding one hundred dollars.

Section 9. This act shall take effect and be in force from and after its passage and publication.

WATER AND WASTE PIPES.

The leakage of water pipes behind decorated walls and in fine ceilings is a sufficient argument against casing or covering service pipes. The repairs are generally costly in themselves, and they entail the additional services of the carpenter and decorator, as well as those of the plumber. Pipes in casings, or set in walls or partitions as they pass from floor to floor, provide especially inviting runaways for mice, rats and vermin of all kinds. Nests are built in these places; scraps of paper, rags and food are carried into them, and they become filthy. It is only necessary to remove a covering board from almost any casing to prove this point in a most convincing manner. Even those in comparatively new buildings will be found surprisingly foul.

These casings, recesses or wall-pockets, as the case may be, serve another and usually very unexpected purpose. They act as ventilators, and distribute odors from the kitchen and cellar to all parts of the building. In the performance of this duty they are faithful and impartial. The hollow walls and floors which are nearly universal in the American system of construction greatly assist in this work. Many of the fine French flats which were first erected in the city of New York are now rented with difficulty, owing to the odors which pervade them. When shut up for a short time they are almost unbearable. Rents have of necessity been reduced to one-third the original figures, from this reason alone. The cause is usually found in the careless and ignorant arrangement of pipes and their cases. The odors from the kitchens are carried everywhere. Stale odors from closets and from food from kitchens and garbage-boxes are mingled and distributed with perfect fairness to all the occupants. The large air-shafts, usually held responsible for this state of things, have very little to do with it. The casings open at the ceiling of each kitchen, communicate with all the floor and wall spaces, and usually take their supply of odors from a point very near the range. All of them are directly connected with the cellar, and usually start in some way from the janitor's kitchen.

Numberless complaints coming from new flats of sewer-gas are finally traced to the odors of cabbage, turnips, ham, onions, etc., which have come from the janitor's kitchen. In many buildings this kitchen is directly under the parlor of the first-floor apartment, and is separated from it by one thickness of boards and an inch of plastering. That there should be foul smells on the first floor is not to be wondered at. Tests of the plumbing in these cases are made, and its perfection proved.

There is nothing to be said upon the other side of the question. There are no good reasons for putting pipes out of sight. When people say, in the face of these facts, that they can't bear the suggestiveness of having the pipes where they are visible, they make an acknowledgment that they prefer hidden filth, danger to life, health and property, to a right construction. Life and health cannot induce them to accept and frankly tolerate their plumbing work.

Pipes carried openly through a building are not dangerous because their condition can be constantly observed. If accidents occur, the point at which the break takes place can be reached at once and repairs easily made. The quality of the work gains materially, because the plumber takes pride in putting up work which is to be exposed. He has a natural and very justifiable pride in having the workmanship creditable to himself. This pride is increased by certain traditions of the trade, and there is a double gain to owner and occupant.

Exposed pipes may be made to pass through floors without leaving an opening. The floor around the pipe can be made perfectly tight, and the passage of odors cut off completely—at least, as perfectly as the nature of plaster will permit. This is an enormous gain, while the runways for rats and mice, roaches and water-bugs, are entirely done away with. These vermin can then be exterminated. This is practically an impossibility in houses where casings protect them and afford perfect breeding-places. Cut off from free passage to all parts of the house, they prefer more congenial quarters, where rapid transit and fields for colonization are provided.

As decorative features of the rooms, cast-iron pipes at least are often treated in a beautiful way. The body of the pipe is colored a very dark-bluish gray, scarcely removed from black. The bands are silver or nickel bronzed, or have silver or nickel leaf applied to them. Occasionally the whole pipe is finished with two or three shades of bronze. Lead and wrought-iron pipe receive somewhat similar treatment. The lead is often polished and varnished. There is, however, no difficulty in making the decoration of the pipes strikingly effective.

It is satisfactory to know that architects and builders are beginning to break away from the old custom, and expose their pipes wherever the prejudices of the owners can be overcome. Some of the best men in the profession are treating the plumbing work in a manner to show constructively its importance and value. The result is a great gain both to owner and occupant.—*Mechanica News.*

STEAM-PIPE REQUIRED FOR HEATING.

The question arises, How much pipe is required to heat a building of a certain cubic capacity? Of course, this varies with the temperature of the steam used, the degree of heat required to be kept up, the frequency with which the doors are opened, the temperature of the outside air, the intensity of the wind, the area of window surface, etc. There are no two places in which the conditions are exactly alike, and it would be hard to lay down an absolute rule for any fixed set of conditions. But there are some good data which will do to start from, and a writer in the *Mechanical News* calculates it as follows:

We may start out with the fact that one unit of heat will raise 55½ cubic feet of air from 62 to 63 deg. F., and can use these figures, no matter what the temperature and the steam of the building to be warmed, or what outside atmosphere.

For low-pressure steam—say about five pounds above atmosphere or by the gauge—the length of four-inch pipe required for heating the air is found by multiplying the volume of air in cubic feet per minute, to be warmed, by the difference of the temperature in the room and outside, and dividing by 336. The answer will be the length of four-inch pipe in feet, and will be also about the number of square feet of pipe, as a four-inch pipe has 12.57 inches circumference, hence but a very trifle over 144 square inches of surface per foot of length. (For one-inch pipes the divisor required is 84 instead of 336.)

It will take one square foot of direct boiler surface, or its equivalent of floor surface, to keep a temperature of 60 deg. F. in a room with steam at five pounds by the gauge, and the ordinary range of temperatures in and out of the room.

KANSAS CITY MASTER PLUMBERS SUED.

It will be remembered by the readers of the SANITARY NEWS that mention was recently made of the announcement by L. B. Cross of Kansas City that the suit against the individual members of the Master Plumbers' Association of that city had been dismissed at the plaintiffs' costs. This suit, known as the Nicol and Strong suit, was begun last spring against the individual members of the Kansas City association, because the organization is not incorporated. This suit caused a great deal of uneasiness among the timid members of the association who could see a

$50,000 judgment rendered against them in the near future, and they felt greatly relieved when they heard that the suit had been dismissed for want of prosecution. R. S. Kirtley, Secretary of the Association, informs us that they were greatly surprised to learn that a new suit was begun on the 13th against the members of the organization by the same parties.

The opinion among master plumbers of Kansas City is that the original suit was a mere bluff, and it would seem that the plaintiffs have commenced the second suit in order to keep the matter undecided as long as possible and thereby hoping to avert the odium of their former mistake. We take pleasure in printing the following account, of the last suit, which appeared in the *Journal* of that city on February 14:

"A $50,000 damage suit for conspiring to boycott was filed in the circuit court yesterday by A. A. Nicol and Alexander Strong, plumbers, against W. G. Ashdown, James Allen, F. J. Beardsley, James Allison, James Bewsher, Henry Bewsher, Henry Bendell, James Cotter, Ephriam Dougherty, Lawrence A. Farley, G. B. Edgar, Harry B. Farley, W. H. Fleming, E. Farley, H. Goss, H. Martin, H. D. Goss, E. D. Hornbrook, L. B. Cross, Thomas Hanley, Samuel Kerrigan, Harry A. Jeffries, F. A. Miller, D. M. Quay, J. L. Kyle, Robert S. Kirtley, George P. Kirtley, P. Usher, Dent Yates, Charles Doherty, Tim Cotter, J. McDonnell, M. A. Cotter and Henry Miller, members of the Association of Master Plumbers of Kansas City, Mo.

"In the petition it is alleged that the plaintiffs are engaged in the business of plumbing and gas fitting in Kansas City, and that they have a large business and have always borne good reputation and standing in their business as plumbers and gas fitters; that the defendants are confederated and associated with similar associations throughout the United States, and that they refused to admit plaintiff Alexander Strong to membership and expelled his partner, A. A. Nicol, as an act of malice, in March, 1890.

"Plaintiffs further state that in the month of March, 1890, at the time the defendants expelled Plaintiff Nicol from said association, the defendants wrongfully, maliciously and without just cause conspired together for the purpose of injuring the plaintiffs and driving them out of the business of plumbing and gas fitting, and to wholly deprive them of all power of prosecuting their work as contractors aforesaid, and to that end notified all wholesale dealers and supply houses in Kansas City that deal in and furnish gas fitters supplies that they must not sell to or furnish the plaintiffs with gas fitters' and plumbers' supplies under penalty of the withdrawal of the patronage of each and every member of said association from said wholesale or supply houses engaged in the sale of gas fitters' and plumbers' materials; that said wrongful action so terrorized the wholesale supply houses that they absolutely refused to sell to the plaintiffs the supplies needed for completing work already contracted for and that such action has rendered uncertain the fulfillment of all contracts entered into by the plaintiffs, so that they allege they have been damaged in the sum of $50,000."

COLORING BRASS WORK.

A beautiful violet color is imparted to brass work by the application of chloride of antimony, says a writer in *Work*. Get the work bright and clean by the usual methods, either in lathe or by dipping, etc.; heat it over gas flame or spirit lamp, so that the water will steam off it but not fizz, and then apply the chloride of antimony liquor with a piece of rag or pad attached to a piece of wood; when the metal has assumed an even color, polish by rubbing with a soft cloth perfectly clean and dry, and protect with a coat of clear lacquer. Should you prefer a darker color use either of the following recipes: 1. To one part of oxide of iron, or iron filings, add one part arsenic and twelve parts hydrochloric acid. Dissolve the oxide of iron or filings in the acid, then add the arsenic, strain and bottle for use. 2. One pint of strong vinegar, one ounce of sal-ammoniac, one-fourth ounce arsenic, one-half ounce alum; dissolve in the vinegar and bottle. These mixtures are to be applied in the same way as chloride of antimony, and, as you are doubtless aware, the ultimate shades may be varied by treating with various lacquers. In all cases the work should be polished with a dry cloth immediately the desired color is obtained, and in the case of the two latter receipts the work should be lacquered at once; but with the chloride of antimony this is not essential. With regard to Florentine bronze, the only recipe I know of is the following: The work having been finished bright and clean, is covered with a thin coating of copper. Now make a paste with Spanish brown twelve parts, and black lead one part, in hot water. Dissolve a small quantity of oxalic acid—say as much as will fit on a sixpence—to one-half a pound of other ingredients, also in hot water, and thoroughly mix the whole; thin with hot water to a workable consistency, and apply with a soft brush. When dry, polish with a medium brush. This done, the work is ready for lacquering, a pale lacquer being employed.

CHICAGO MASTER PLUMBERS.

A large number of Chicago master plumbers assembled in Grand Army Hall on Thursday evening, February 26th, for their regular bi-monthly meeting. President David Whiteford was able to be present and called the meeting to order.

Secretary Harry Black read the minutes of the last meeting which were adopted as read.

Mr. Mandable of the Sanitary Committee made his bi-monthly report.

Mr. Wade of the License Committee submittted his report on this subject.

On motion of Mr. Rock the License Committee was permitted to make certain expenditures for printing, etc.

Mr. Roche of the Apprenticeship Committee asked for more time to prepare his report which was granted.

The Chair appointed as a visiting committee Mr. Negley for the North Side, Mr. Irons for the West Side, Mr. Rourke for the South Side, and Mr. Breyer for the northwest section of the city. Each one of the committee is authorized to appoint an associate.

A motion was carried that the secretary cast the unanimous ballot of the association for Mr. Mertz, who was welcomed to the hospitality of the organization in a very happy manner by President Whiteford. Mr. Mertz responded with a fitting speech.

The following directors were elected: Charles Byrne, David Bain and Daniel Rock.

A five minutes' recess was taken, after which the association went into executive session.

AMONG THE PLUMBERS.

Mr. Field, of the plumbing firm of Field & Wilson, at Decatur, Ill., is in the city on a business and pleasure trip. Mr. Field reports the trade good in Decatur at present.

Explosions in sewers seems to be confined to this section of the country at present, and is no longer a luxury exclusively enjoyed by the cultivated East. Indianapolis, Ind., and Columbus, Ohio, experienced a great shaking up from this cause last week, and our own beloved Chicago is now and then disturbed by the top of a manhole flying through her streets with lightning rapidity.

C. T. Fitts, of C. T. Fitts & Co., Sioux City, Iowa, is in the city on business.

R. P. Probasco is getting some nice contracts of plumbing work now. He will fit up a residence on Bowen avenue, one on Forty-seventh street, one on Grand boulevard and Forty-first street, and another on Michigan and Market streets.

Joseph Creswell, of the firm of Davis, Creswell & Co., Denver, Col., called on the L. Wolff Manufacturing Co. this week at their magnificent show rooms on Dearborn street. He reports everything booming in that boom city of Denver.

Edward L. Cook is one of the leading sanitary plumbers of Buffalo, N. Y.

Our intentions were good last week in our comment on the artistic notices sent out by Secretary Harry Black, but the intentions of the printer were evidently hostile to the genial secretary for he twisted the sentence so as to read that there might be something artificial about Mr. Black. This we wish to correct, and most humbly apologize to Mr. Black for the typographical error.

Wm. J. Fitzpatrick, the newly elected President of the Brooklyn Master Plumbers' Association, is doing quite as much hustling in his new office as he did in that of Secretary for his association. He has recently issued an addition to his official list of licensed plumbers in Brooklyn.

Messrs. Holbrook and Wheeler, of the firm of Holbrook, Merrill & Stetson, at San Francisco, Cal., were calling on the supply houses in Chicago this week. They intend to visit New York and the East next week, looking up new ideas in the plumbing line. This firm is one of the largest jobbing houses on the Pacific slope and is doing a large amount of business this season.

The contractors and builders of Davenport, Ia., met at Masonic Temple on the 12th and organized a Builders' Exchange and elected the following officers: President—T. W. McClelland; Vice-President—Victor Huot; Secretary and Treasurer—M. Bunker. Directors—T. W. McClelland, Victor Huot, John Turner, William Kelly, Peter Stelling, John Soller and H. Mecklenburg.

E. L. Burgoin, Secretary of the Master Plumbers' Association at Los Angeles, Cal., writes us that the new sanitary law of their city is now in the hands of the Board of Health Committee, subject to their approval after which it will properly come before the Common Council. He thinks there is more work to be done by the master plumbers of California than by the craft in any other state of the Union. He says it rests with the master plumbers of his state to make California the Sanitarium of the world, she alone possessing the natural advantages necessary to sanitary science.

M. J. Roughan is doing plumbing work on the large Manhattan building and a residence for C. C, Hersen, corner Goethe street and Lake Shore drive. He has moved his place of business from 29 to 25 Quincy street.

A. W. Bensinger will do the plumbing work on the new Jewish church on corner of Indiana avenue and Thirty-third street.

Mr. H. Fred Fischer, a prominent plumber of Bay City, Mich., spent a few days in the city this week, among friends.

National President Robert Griffith has received a letter from Evansville, Ind., stating that the new Master Plumbers' Association, recently formed by him, has elected officers for the ensuing year. Alexander Crawford has been honored with the position of president, while Chas. Wahnsiedler will act as secretary and treasurer of the new association. Mr. Griffith informs us that all the firms of Evansville are in the association, and everything is working nicely in the new organization.

San Francisco, Cal., comes forward with a new organization, and joins the National Association of Master Plumbers with thirty members. The new officers are Jas. Shepard, president; J. B. Butterworth, financial secretary; W. L. Daniel, treasurer, and H. T. Bush, corresponding secretary. The master plumbers on the Pacific slope are very enthusiastic, and there is every indication that they will be well represented at the next convention of the National Association.

The Detroit Heating and Lighting Company have opened a branch at 114 Liberty street, New York, where they have secured a fine store for stock and show rooms. This branch will be managed by Mr. George H. Raymond, formerly president of the Raymond Furnace Co., of Norwalk and New York. He will look after the trade in Western Massachusetts and Connecticut, Southeastern New York and New Jersey. The specialty of this company, as is well known, is the Bolton Hot-Water Heater, which they have made popular throughout the United States. Their output for 1890 was between three and four times that of 1889, and they will doubtless get their full share of Eastern trade this season.

The master plumbers of Baltimore met at the Hotel Brooks on the evening of February 4th, for their tenth annual banquet. The president of the association, Mr. Joseph C. Mitchell, was on hand and presided over the meeting in his usual happy manner. He was ably assisted by ex-President E. J. Hannan and Dr. J. F. McShane, assistant Health commissioner. Among the toasts responded to were "Our Guests" by President Mitchell, "Sanitation of Our City" by Dr. J. F. McShane, "The National Association" by E. J. Hannan, "Mercantile Interests of Our City" by Arthur Emery, "Local Associations" by John McCart, "The Influence of Modern, Plumbing Over Vital Statistics of Cities in the U. S," by A. R. Carter, Secretary of the Health Department. The speeches were interspersed with music which made the evening very enjoyable throughout. The following gentlemen were among those present: E. J. Hannan, Jos. C. Mitchell, Dr. Geo. H. Rohe, Dr. J. W. Chambers, Arthur Emery, Dr. J. F. McShane, A. R. Carter, W. E. Scully, W. W. Rowles, John Trainor, James Healy, John McCart, Harry Black, Geo. Knipp, Thos. B. Boland, James Millar, Jr., James Connelly, W. H. Mills, Wm. McAllister, John H. White, Wm. B. Tyler, T. J. McNulty, James Trainor, John Randall, Geo. Addison, John Graham, D. N. Sullivan and M. Lotz.

TRADE AND BUSINESS NOTES.

A circular is at hand setting forth the merits of the Grinnell Automatic Sprinkler, manufactured by the Providence Steam and Gas Pipe Company, Providence, R. I., with branch offices in Boston, Buffalo, Chicago, Cincinnati, St. Louis, New York City, Philadelphia and New Haven. The patentee is Frederick Grinnell, of Providence, R. I., and it is claimed for his system that the Grinnell valve intervenes between the outside water-supply, beyond the reach of frost, and the system of sprinkler pipes within the building. The construction of the Grinnell valve is such that air under moderate pressure (much less than the water pressure) within the sprinkler pipes keeps this valve closed, and thus excludes the water. The opening of one or more sprinklers in case of fire allows the air to escape from the sprinkler pipes, and the Grinnell valve is at once opened by the outside water-pressure; the water instantly fills the sprinkler pipes, and is discharged upon the fire in a profuse shower from every unsealed sprinkler. A comparative statement of losses with and without this sprinkler makes a showing most favorable to the sprinkler, and the argument is clinched in favor of this system with a remarkable saving in loss from fires, which puts its value in the shape of dollars and cents.

A catalogue is before us of the "A. D." Syphon Water Closet, manufactured by Fred Adee & Co., manufacturers of plumbers' supplies, 90 Beekman street, New York City. The claims advanced for this closet are: First—That it is the only double-trapped syphon water-closet that effectually and positively prevents foul air from escaping into the room, either through the flush-pipe and out of the cistern or at the arm of the bowl. This feature is secured by the curved passage in supply-opening which traps the supply or flush pipe to the depth of about six inches, and is of the utmost importance because it provides ample security against sewer air in the event of the syphoning or partial emptying of the lower trap, which frequently happens even when vented in the ordinary way. Second—They claim it is the only closet which has the vents properly placed—*i. e.*, so that they cannot be clogged; the flow being away from instead of directly into the vent-openings, as is generally the case, and, for convenience of the plumber, being adjustable to either the right or left side. Third—It contains about six inches depth of water in the bowl, sufficient to immerse excreta and thereby reduce the diffusion of disagreeable odors to the minimum, as well as to flush the soil-pipe at each discharge—also a very important feature. Water-closets are such important sanitary fixtures that all improvements and commendable features should receive liberal consideration. We cannot support the statement that the "best closet is bad enough," for it is easily possible to construct and adjust a closet in such a manner that, with proper care, it will offer no possible danger; and the foregoing claims for the "A. D." water-closet are worthy of favorable consideration. It is made in many different styles, from the plain to the highly ornamental, and there is nothing in the price to cause a panic or stampede among consumers.

Steam is thick or thin according as it is hot or cold.

Bricks for artistic decoration are now made of old bagging.

A torpedo net constructed of interlocking steel rings is soon to be put to a practical test.

A novelty in bookbinding is announced in the employment in it of metal as a substitute for cardboard.

Three pounds of water per hour evaporated from each square foot of heating surface in a boiler is a fair average for a good boiler.

The high explosive carbonate has recently given very satisfactory results, and it has been proved that it is a stable compound that can be stored for a length of time without deterioration.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Traverse City, Mich.: Messrs. Wilhelm & Bartak have secured plans from Mr. W. G. Robinson, of Grand Rapids, for a three-story brick block, containing an audience hall, stores, offices, etc., to cost about $20,000.——Seattle, Wash.: A company has been organized with a capital of $200,000 for the purpose of erecting an opera house.——Salt Lake City, Utah: Second South street, a six-story office building; cost, $120,000. Harrison & Nichols, architects.——Minneapolis, Minn.: 1415-1419 South Eighth street, three-story brick block of flats; cost, $30,000. Orff Bros., architects.——St. Louis, Mo.: South side of Cabanne avenue, east of Bell avenue, a four-story brick academy and monastery; cost, $150,000. Visitation Convent Corps, owners. South side of Westmoreland place, between Kings Highway and Lake avenue, a two-story brick dwelling; cost, $25,000. E. C. Sterling, owner.——Norfolk, Va.: Brambleton Ward school; cost, $22,500, Geo. C. Moser is preparing plans.——Richmond, Va.: A hotel, to cost $150,000, and a public building to cost $75,000, are to be erected.——Macon, Ga.: The Knights of Pythias of this city are to erect a building, to cost $25,000. Address the Macon Pythian Castle Association for particulars.——Harriman, Tenn.: The East Tennessee Land Co. will erect a hotel. To be four stories. brick, with stone trimmings; cost, $100,000. C. W. Harris is the superintendent.——Dallas, Tex.: A cathedral, to cost over $100,000 will be erected. James Moroney is interested. Gill, Mead & Gill have completed plans for a $40,000 building for the Bankers and Merchants' Bank. The J. B. Legg Architectural Co. have plans for a bank and office building, to be eight stories, of brick with stone trimmings; cost, $120,000.——Waco, Tex.: The J. B. Legg Architectural Company, St. Louis, Mo., and Dallas, Tex., pave prepared plans for an opera house. To be three-stories high, built of common and pressed brick; cost, $45,000.——Louisville, Ky.: Jefferson street, near Nineteenth street, a brick and stone church; cost, $35,000. Third Presbyterian church, owner.——Owensboro, Ky.: A tile factory, to cost $50,000, is to be erected. ——Cincinnati, Ohio: Southern avenue, a three-story brick and stone school house; cost, $75,000. H. E. Siter, architect.——Cleveland, Ohio: 590 Euclid avenue, a club house and gymnasium; cost, $30,000. Cleveland Athletic Club, owner. Bolivar street, a college building; cost, $40,000. Coburn & Barnum, architects. Ontario and Champlain streets, a brick and stone restaurant building; cost, $20,000. Crainer & Fugman, architects. Superior, Water and Spring streets, a stone and iron office building; cost, $175,000. Burnham & Root, Chicago, architects. Fourth avenue, near 32nd street, a brick hotel; cost, $30,000. Heirs of C. M. Stewart, owners.——Marietta, Ohio: Union depot to be erected; cost, about $25,000.——Chicago: Bettinghofer & Hermann have plans for a three-story store and flat building; cost, $15,000. The same architects have plans for a three-story flat building. They have also completed plans for the North End Bowling Club. Larabee street, three-story apartment building. Bettinghofer & Hermann, architects. Forest avenue, three stone front residences. L. B. Dixon, architect. F. B. Townsend has plans for a four-story store; and flat building; cost, $20,000. F. Foehringer has plans for a three-story and basement bakery, to be built on the North side. He also has plans for a three-story flat building. The Bowmanville Home of Mercy will have a two-story and basement addition added. L. G. Halberg, architect. Dearborn street, three-story apartment building. J. L. Merriam, architect. The same architect has plans for three two-story residences to be erected on Champlain avenue. Park avenue, two-story residence. William R. Gibb, architect. The same architect has plans for a three-story flat building; cost, $15,000. Washington street, next to the Telephone Building, eight-story office building. Julius H. Huber, architect. Michigan avenue and Twenty-sixth streets, three-story store and flat building; cost, $25,000. George Garnsey, architect. The same architect has plans for a three-story flat building and a two-story residence. Division street near Ashton, six three-story residences; cost, $85,000. C. M. Palmer, architect. The same architect has plans for a four-story apartment building to be erected on Dearborn street. Twenty-first street near Western avenue, five-story brewery; cost, $100,000. Theodore Lewandowski, architect. The same architect has plans for a three-story flat building to be erected on Ashland avenue. He also has plans for a four-story store and flat building to be erected on Noble street. He also has plans for a four-story store and flat building; cost, $15,000. The same architect has plans for a three-story store and flat building. ——Cherokee, Ia.: Kramer and Zoll of Findlay, O., have plans prepared for a court-house; cost, $80,000. L. W. Beal desires bids on the same until March 10.——Hamburg, Ia.: Henry Voss of Omaha has plans for a hotel and store building for the Hamburg Hotel Co.; cost, $25,000. Address H. R. Grape.——Rockford, Ill.: Oscar Cobb, Chicago, has plans for remodeling the opera-house.——Deron, Pa.: A $60,000 residence will be erected. Frank Miles Day, Philadelphia, architect.——Swedeland, Pa.: A large foundry will be erected by R. Hecksher & Co.——Iron Mountain, Mich.: High school building will be erected; cost, $28,000. J. E. Clancy, architect.——York, Neb.: $25,000 college will be erected. C. C. Rittenhouse, Hastings, architect.——Victoria, British Columbia: Stonby & Wilson have plans for a five-story brick block.——Oakland, Cal.: E. H. Pardee will erect a $35,000 business block. F. K. Shattuck will erect a $200,000 building on Broadway.——St. Louis, Mo.: Chestnut street, seventeen two-story dwellings; cost, $60,000. A. Cooper, owner. Dexter street and Compton avenue, six-story brick stock house; cost, $50,000. St. Louis Brewing Association, owner.——San Jose, Cal.: A $250,000 malt-house will be erected by the San Francisco Brewery.——Monterey, Mex.: The Great National Mexican Smelting Company will erect an office building and laboratory. Robt. S. Roeschlaut, Denver, architect.——New York City: 345-347 Twenty-ninth street, three-story brick brewery; cost, $45,000. O. C. Wolf, architect. 1-5 Catherine street, five-story brick store and tenement; cost, $35,000. Julius Kartner, architect. Greene street near Waverly Place, eight-story brick store; cost, $140,000. Alfred Zucker, architect. 123-125 Bleecker street. eight-story brick store; cost, $130,000. Same architect. 95th street near Ninth avenue, two five-story brick flats; cost, $48,000. C. Sidney, architect. 119th street near Lenox avenue, seven three-story dwellings; cost, $10,000. C. Sidney, architect. 64th street, two five-story brick flats; cost, $40,000. H. Davidson, architect. 330-334 Fourteenth street, West, brick church improvements; cost, $50,000. Jno. S. O'Meara, architect. 718-722 East Eleventh street, five-story brick and stone factory. Krutzer & Rohl, architects. Seventy-eighth street and Amsterdam avenue, six-story brick and stone flat and two five-story flats. G. A. Schellenger, architect. Lexington avenue and 121st street, five-story flat; cost, $60,000. J. C. Burne, architect. Rivington and Sheriff streets, six-story tenement and stores. Herter Bros., architects. Second avenue and 112th street, five-story tenement and store. J. Wolf, Jr., architect. Sixty-second street and Eleventh avenue, five-story brick bakery. J. Boekel & Son, architects.——146 Rivington street, two six-story brick stores and flats; cost, $90,000. Herter Bros, architects. Fourth avenue between 50th and 51st streets, five-story brick storage; cost, $50,000. O. Wolf, architect.——Brooklyn, N. Y.: Jefferson avenue, four three-story dwellings; cost, $28,000. John E. Dwyer, architect. Hart street, four two-story dwellings; cost, $24,000. Thos. E. Greenland, owner.——Philadelphia, Pa.: 35th and Wharton streets, twelve dwellings will be erected. M. E. O'Brien, architect. William C. Merritt will erect a number of houses near 40th street and Girard avenue. Joseph H. Slifer will erect eight houses on Bancroft street.——Washington, D. C.: Eleventh and G streets, large store building; cost, $100,000. A. Lisner, owner. The Washington and Georgetown R. R. Co. will spend $500,000 in buildings on the square between 13½ and 14th and D and E streets.——Holyoke, Mass.: Corner Prospect and Maple streets, a three-story stone and brick parochial school; cost, $60,000. F. S. Newman, of Springfield, Mass., architect.——Springfield, Mass.: North Main street, a four-story brick block of stores and tenements; cost, $40,000. Jason Perkins, architect.——Malone, N. Y.: Armory; cost, $40,000. I. G. Perry, Albany, N. Y., architect.——Brooklyn, N. Y.: Third street, South side, near Seventh avenue, four three-story brick dwellings; total cost, $36,000. John L. Young, architect. Covert street, South side, near Central avenue, twenty-nine two-story and basement frame dwellings; total cost, $72,500. F. W. Ames, architect.——Columbia, Pa.:

Third street, a row of brick dwellings; cost, $20,000. J. A. Dempwolf, architect.——New Haven, Conn.: L. W. Robinson has completed plans for several large buildings.

HEATING AND LIGHTING.

Woodberry, Md.: The Woodberry and Belt Electric Light and Power Co. has been organized, to erect an electric light plant. The capital stock is $100,000. J. E. Hooper, president.——Columbus, Ga.: The Brush electric Light and Power Co. will put new machinery in its electric light plant.——Cicero, Ill.: The Cicero Water, Gas and Electric Light Co. has filed a certificate setting forth an increase of capital stock from $130,000 to $190,000.——Wheeling, W. Va.: The Wheeling electric light bill passed the Senate, February 16th, and was sent to the House for its concurrence.——Newport, Va.: An electric light plant is to be established, at an expenditure of $250,000. U. D. Grover is at the head of the project.——Mount Airy, N. C.: An electric lighting plant is to be established.——Victoria, B. C.: An expenditure of $50,000 is to be made for an electric lighting plant.——Batesville, Ark.: A. F. Benson wants full outfit for an electric plant.——Lake Charles, La.: J. A. Landry & Co. will erect an electric light plant.——Richmond, Va.: The city council has passed a resolution appropriating $75,000 for the erection of an electric light plant. Address the mayor for particulars.——Washington, D. C.: The National Electric Light Company has been incorporated, with a capital stock of $250,000, to erect an electric light and power plant.——Durham, N. C.: The Durham Electric Light Company will put incandescent light machinery in its electric light plant.——Raleigh, N. C.: A bill has been introduced in the Legislature to incorporate the North Carolina Electric Power Co.——Waynesboro, Md.: A stock company has been organized to erect an electric light plant.——Troy, Ala.: The city will erect an electric light plant. The mayor can give information.——Arkadelphia, Ark.: M. P. Hillyer, R. A. Holden, E. N. Maxwell and others have incorporated the Arkadelphia Water and Light Co., to erect an electric light plant and construct water-works. The capital stock is $50,000.——Greeneville, Tenn.: The Greeneville Electric Light Company will put new machinery in its electric light plant.——Murfreesboro, Tenn.: The City Illuminating Company desire new machinery for its electric light plant.——Highlands, Colo.: Frank P. Arbuckle is preparing to put up an electric light plant and solicit proposals on materials.——Charleston, W. Va.: The Charleston Gaslight Company and the Kanawha Electric Light Company have consolidated, and will put an additional dynamo in the electric light plant, and a new gas-holder and exhauster in the gas-works.

SEWERAGE NOTES.

Covington, Ky.: New sewers will be constructed.——Hackensack, N. J.: The city will construct new sewers.——Biddeford, Me.: The city will have new sewers.——Wilmington, Del.: $500,000 will be expended on sewers and other improvements.——Taunton, Mass.: The aldermen and city council have passed orders authorizing the mayor to petition the Legislature for power to establish a sewer district, and authority to raise money beyond the debt limit to an amount not exceeding $200,000.——Winnipeg, Man.: The city will expend about $300,000 for sewer work.——Albion, N. Y.: A new sewerage system is being discussed.——Hamilton, O.: The city will construct new sewers.——Hanford, Cal.: A complete system of sewers is to be established.——Newport, R. I.: The tax-payers will soon vote on the proposition authorizing the city council to issue bonds in the sum of $70,000 for the extension of the sewerage system.——Cincinnati, O.: The city engineer has completed plans, etc., for the Eighth street sewer.——Woodland, Cal.: The trustees have passed an ordinance stating that the city needs a sewer system.——Redlands, Cal.: The officials are considering the question of establishing a system of sewers.——Salem, O.: Plans are now being prepared for a system of sewers under the direction of Edward D. Bolton, C. E., 44 Broadway, New York.——Waco, Tex.: Wm. B. King, city engineer, has prepared plans for a system of sewerage, to cost about $50,000.——Sioux Falls, S. Dak.: The Sioux Falls sewerage bill is soon to be introduced in the Assembly.——Brooklyn, N. Y.: The Bay Ridge and Fort Hamilton Citizens' Association has been discussing the question of sewerage for these places and New Utrecht.——Newark, N. J.: An application has been made by the city council to have a new set of commissioners appointed, to make a new assessment for the intercepting sewer.—— Orange, N. J.: The sewerage system is to be built from plans by C. P. Bassett, of New ark; and a double system is provided for—one for the sewage proper, and the other for the drainage and storm-water. The outlet is to be by the way of the Second river to the Passaic, at Belleville. The cost of the entire system will be in the neighborhood of $500,000.——Baltimore, Md.: An appropriation of $38,600 has been made for the Reed street sewer.——Roanoke, Va.; The plans prepared by Mr. Rudolph Hering for a system of sewerage have been submitted to the city council.——Los Angeles, Cal.: The question of a better method of disposing of the sewage is under consideration, and a meeting has been held between the city council and the owners of property between the city and the ocean. It is thought that, while the sewage should be used for irrigating purposes, there should be a connection to the ocean, so that the surplus water could be carried off during the rainy season.

WATER-WORKS NOTES.

Watertown, Minn.: The city proposes to put in water mains. Address F. A. Barlt.——Corpus Christi, Tex.: The Corpus Christi Water Company will construct water-works at a cost of $200,000.——Wheeling, W. Va.: The Glendale Company will construct water-works. Address George Adams.——Union City, Tenn.: The Union City Water Company is receiving bids on water-works and an electric light plant.——Bastrop, Tex.: The Bastrop Improvement and Investment Company will soon want pumping machinery and piping.——Port Gibson, Miss.: The mayor can give information concerning the construction of water-works.——Harodsburg, Ky.: J. P. Herdie, of Williamsport, Pa., is preparing the plans and specifications for the new water-works.——New Ulm, Minn.: The city will put in additional water-mains during the coming season. Address C. L. Roos.——Park City, Utah: Plans and specifications have been prepared for a system of water-works.——Macomb, Ill.: The city will soon vote on the question of water-works.——Anaheim, Col.: The city will construct water-works the coming season.——Keene, N. H.: About $50,000 will be expended for iron pipe.——Lincolnton, N. C.: The mayor can give information concerning the new water-works.——Dayton, Tenn.: Dayton and Greenville will soon put in systems of water-works. The mayor of each place can be addressed.——Cleburne, Tex.: The Cleburne Ice, Light and Water Company has been incorporated with $50,000 capital to construct water-works, etc.——Waco, Tex.: The Waco Water, Light and Power Company has been incorporated with a capital stock of $500,000.——Bentonville, Va.: The Bentonville Mining and Improvement Company will construct water-works. F. H. Bolen is manager.——Charles City, Iowa: About six blocks of 4-inch pipe will be put in this summer. J. S. Sterns, superintendent.——Cuthbert, Ga.: Water-works will be put in at an early date. Robert L. Moye, mayor.——Danville, Ind.: A water-works system will be put in this year. Thomas Armstrong, city clerk.——Golden, Col.; The city will lay about one mile of mains this spring. B. P. Quaintance, superintendent.——Norwalk, O.: The city will vote on bonding the town for $55,000 for extending the water service.——Fort Valley, Ga.: A company has been formed to construct water-works.——Clarksdale, Miss.: Clarksdale will construct water-works and install an electric light plant. Address the mayor.——Grenada, Miss.: The city proposes putting in a water-works system. Address the mayor.——Zanesville, O.: The finance and water-works committee of the city council have reported in favor of purchasing a 4,000,000-gallon pump to cost $15,000, and mains at an expense of $21,000 or $36,000 in all.——Greenville, Ill.: A stand-pipe will be built this year. W. A. Allen, mayor.——Grand Junction, Col.: One mile extension of water mains will be made. N. J. Krusen, superintendent.——Denver, Col.: Five miles of extensions of 6-inch pipe will be made during 1891. W. A. Underwood, president water-works company.——Havana, Ill.: Nine thousand feet of 4-inch pipe will be put in as soon as weather permits.——Kendallville, Ind.: The city will extend pipe line 4,000 feet. Herman Krueger, superintendent.——Camden, Ark.: Eleven thousand feet of 4 inch

pipe will be put in this year.——Orange City, Fla.: A water-works plant will be constructed.——Carrolton, Ga.: The city council desires to contract with a company for the construction of a water-works system. Address B. D. Jackson.——Ponoma, Cal.: The city will put in fifty more hydrants. Address H. J. Nichols.——Lafayette, Ind.: The West Lafayette Water Company has been formed by W. Weirtz and others. Capital stock is $50,000.——Prescott, Ariz: A large number of mains and several hydrants will be desired next month. Address J. F. Mahoney.

BIDS AND CONTRACTS.

Norwalk, Conn.: Sealed proposals will be received at the office of the Board of Water Commissioners until noon, March 10, 1891, for all work connected with the laying of about 25,000 feet of pipe. Plans can be seen, and specifications or other information can be had at the office of W. B. Rider & Son, engineers, West avenue, South Norwalk, Conn.——Taylor, Tex.: E. S. Mackin, architect, will receive bids until March 15, for the erection of a church, to be built of pressed brick and stone. Estimated cost, $10,000.——Youngstown, Ohio: Proposals are wanted until March 14th, for the construction of 4,600 feet of brick and pipe sewer. Address G. D. Hersey, city engineer.——Lockport, N. Y.: Proposals are wanted for public lighting for a term of three years from April 1st. Address the city clerk.——Newark, Ohio: Proposals are wanted until March 4th, for the equipping complete of an electric light plant. Address Orlando Miller, city clerk.——Duluth, Minn.: Proposals are wanted until March 4th, for improving numerous streets, building certain sewers, and doing other work of a like character. Address George T. Hughes, Clerk Board of Public Works.——Santa Ana, Cal.: Proposals will be received until March 16th, by Ed. Tedford, city clerk, for the construction of a complete system of water-works.——New Berne, N. C.: The city desires to correspond with water-works contractors, with a view to the construction of a water supply system upon the franchise plan. The city would probably contract for sixty hydrants at an agreed annual rental, with the privilege of purchasing the works at the end of one year, or within five years, at a stipulated price. Address Alex. Miller, Chairman Water-Works Committee, P. O. Box 39.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

The smallest known insect, the Pteratomus Putnamii, a parasite of the ichneumon, is but one-nineteenth of an inch in length.

Orris root, from which all violet perfumes are derived, is devoid of odor when dug, and has to be dried in order to develop its qualities.

There are about 60,000,000 parts in a single feather of an eagle. It is stated—2,000 rami, 5,300,000 radii, and 54,000,000 chilla and hooklets.

An "inch of rain" means a gallon of water spread over a surface of nearly two square feet, or a fall of about 200 tons to an acre of ground.

The *American Lancet* says that a five per cent. solution of chloral hydrate will clear the hair of dandruff, and prevent alopecia from that cause.

Steam is a willing servant, and will turn any crank and ask no questions; but it depends upon who made the crank how long it keeps turning.

A petroleum engine has been introduced in a lighthouse in Scotland for working the siren of the fog signal apparatus recently installed.

The new observatory near Tananarivo, Madagascar, will be one of the highest in the world, as the site chosen is about 4,400 feet above the level.

The banana plant has been found to contain a greater quantity of pure fiber than any of the other numerous vegetable products used for paper making.

"LAUGH AND GROW FAT"

Is a wise old saw; yet the close confinement of winter tells even on the merriest. For an agreeable change go to Hot Springs, Ark. The Wabash is the Hot Springs Line. Compartment sleepers Chicago to St. Louis, where direct connection is made morning and evening with through sleepers to Hot Springs. Sleeping car berths through from Chicago reserved in advance.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

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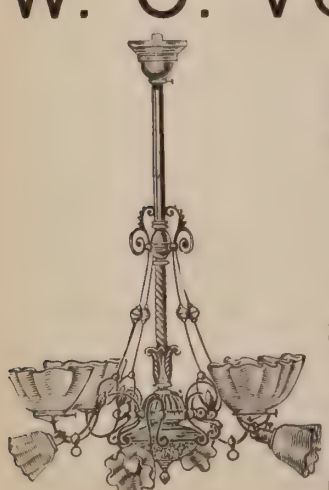

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LONDON OFFICE.

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BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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AT a meeting of the Worshipful Company of Plumbers at Westminster recently the following resolution was adopted: "That this meeting desires to record its opinion that it is essential to the health and comfort of all classes of the community that the plumber's craft should be brought under such systematic regulation and control as to insure the efficient training of its members, and that this can be best effected by the system of National Registration, which requires plumbers to pass qualifying examinations; and the meeting further desires to direct the attention of Parliament to the necessity for legislative enactments to effect these objects."

In England the effort is to secure national legislation regarding the registration of plumbers, and it is pretty generally sustained by the most eminent authorities of that country. In this country efforts to secure state or municipal legislation regarding registration find some people too small to comprehend the great importance of the measure, and they are not happy unless they can display their ignorance in opposing it. Yet the sentiment is widening and growing too strong for the narrow-minded. For this sentiment favoring the advancement of plumbing praise is due the plumbers themselves.

THE subject of river pollution by sewage has attracted a good deal of attention, and is destined to be given yet wider and more serious consideration. A striking example of this pollution was presented when recently a scheme was submitted to the Provincial Board for supplying Niagara-on-the-Lake with a public water supply from the river. In testing the purity of the waters of the river and Lake Ontario at the bell-buoy outside Toronto island, a chemical analysis revealed the fact that the river water was second class as regards purity, the comparative tables being as follows:

	Niagara River at Niagara-on-the-Lake. In parts per million.	Lake Ontario at bell-buoy, In parts per million.
Chlorine	2.00	3.00
Free ammonia	.04	none
Albuminoid ammonia	.12	0.02
Oxygen absorbed in 15 min	.24	0.16
Oxygen absorbed in 5 min	.74	0.508
Total solids	133.00	124.00
Loss on ignition	48.00	

It may be said that the condition of the river water is not caused by sewage pollution, yet the fact remains that the sewage of Buffalo, Tonawanda, and Niagara Falls towns on both sides of the river is emptied into the stream, and the rapids, the falls and whirlpool are not sufficient to purify the water from this pollution. This little table is significant and could be studied with profit when the pollution of a river, from which water supplies are taken, is contemplated.

PLUMBING IN GOVERNMENT BUILDINGS.

Elsewhere in this issue will be found a report of the sanitary condition of the White House. The showing is not favorable to health in that residence of our Chief Executive, and this same bad state of conditions obtains in the majority of government buildings. Complaints have gone out from these buildings for years, and the deaths of some of our high officials have been attributed to the unsanitary conditions of these buildings. We are reliably informed that in the Treasury, Patent Office and Post Office departments there are brick arches for sewers under the buildings, and the fixtures are very old. Steam is blown off into the sewers, and when the boilers are thus blown off steam escapes into the rooms at the joints of the waste and sewer pipes. Other buildings are about as bad, and all will so remain so long as the repairs are made by jobbers and Jacks-of-all-trades as they now are. How far politics go in this matter and rewards are given to hangers-on, we are unable to say, but judging this from other government work, we presume some pets are employed regardless of their ability or desire to do good work. One thing is certain; some have failed to provide proper sanitary arrangements for these buildings, and they will remain in their present condition until a properly qualified plumber be given the opportunity to remedy the gross evils now existing. These complaints have been going out so continuously and so long, and are of such confirmatory character that there is no room for doubt concerning the shameless mismanagement, or no management, of the sanitary arrangements of these buildings.

The good old rule "every man to his trade" aptly applies here. The politician has his place, the statesman his, the official his, the bummer and hanger-on his; but none of these can do plumbing or manifest any sense in regard to having it done. Other matters in connection with these buildings suffer the same neglect and mismanagement, but plumbing, standing so near as it does in relation to health to the highest interests of life, should be taken from the list of political rewards and given to the practical plumber as his special charge. Plumbing cannot be done properly without a plumber any more than can laws be made without law makers. We do not look at the piano for the time of day or go to the coal bin for water. Everything has its place and its use, and when this great law is changed something goes wrong. Such a thing has happened with the plumbing in these

buildings, and evil will result till the law regarding the employment of proper means has resumed its normal sway.

Another matter which may seem to some insignificant in connection with these buildings is really a matter of much importance. The one generally in charge of these buildings is a subordinate whose head is affected with what is sometimes termed "swelled," and who about always does the wrong thing. This kind of people always think they know more than any one else, and when it comes to plumbing or its repair, why, of course, any one can do that, and the result is it is not done at all.

CHIEF INSPECTOR YOUNG'S ANNUAL REPORT.

The forthcoming annual report of Chief Inspector Young will contain many matters of much importance. It will relate to interests that affect the highest public welfare, and the matters which it touches should lie very close to the hearts of the people and receive their most liberal support. For years the smoke nuisance of Chicago has been a standing discredit to the pride and cleanliness of this the second city in the United States, and yet it seemed to give little concern and receive little consideration. Mr. Young took charge of the Smoke Inspection Department March 30, 1890, and his report up to December 31, 1890, will show the following:

Violations observed	3215
Notices served to abate nuisance	2189
Nuisances abated	746
Suits prosecuted	485
Fines of $50 and costs	299
" " 100	1
" " 25	1
" " 20	1
" " 10	1
Cases dismissed on payment of costs	174
Cases dismissed without payment of costs	7
Cases found not guilty	1

While these figures show that from March 30 to December 31, 746 smoke nuisances have been abated, they do not cover the whole effect of the Inspector's labors against this great evil. The energetic discharge of his official duties, and his unflagging efforts in the abatement of this nuisance, were the means of causing the abatement of smoke from many buildings, which the records do not show as they were not officially before the department. Besides these many good citizens desiring a purer atmosphere for their city, and to aid the Inspector in his good work, voluntarily took steps which were successful in stopping the emission of smoke from their furnaces. These also are not recorded, and thus, while the report makes a remarkably good showing, it does not tell the extent to which the services of Mr. Young have extended or the far-reaching effects of his most excellent labors. Enough has been done in this direction to make the effects appreciable in the purer atmosphere, and to demonstrate with certainty the possibility of removing the nuisance—a work deserving high commendation and praise.

The report regarding sanitary inspection will show that, from all the buildings inspected, there has not come one complaint of sewer gas or its evil effects from a single building. This is commentary enough on the wisdom of this department, and the efficient manner in which these duties have been discharged.

There is one feature in this service that is not as it is desired. Some of the inspectors are not acquainted with building construction or the mechanical or scientific arrangement of plumbing. While this has not impaired the efficiency of the services of the department, it has materially increased the labors of officers and inspectors who have had to correct the errors of such inspectors and make renewed inspections where they had failed, owing to a lack of proper qualifications as inspectors. The report will suggest the employment of a corps of inspectors especially qualified for this important service, and to this end will recommend the examination of all sanitary inspectors by a duly appointed and qualified board of sanitary engineers.

In reference to the lady inspectors the report is highly commendatory of their services. The effects of their labors are discernable in the improved condition of females employed in shops, factories, etc., and in the better sanitary arrangements of the places where they are employed. The statistics and records of this department show that the lady inspectors have been painstaking, conscientious and industrious in their labors, and have done an important work for which they are especially fitted and well qualified. Altogether the services of this department have been extensive, far-reaching, and in their effects touch the highest public interests. So important is this department to the highest public welfare that it should be supported with the greatest liberality. The appropriations and the corps of inspectors for this department should be such that its usefulness could be made commensurate with the multiplying needs of this rapidly growing and progressive metropolis.

THE SMOKE NUISANCE.

There is no longer any doubt of the practicability of abating the smoke nuisance on railroads as is shown by the following report of what has been accomplished by the roads running into the city, during the past year beginning with March 1, 1890: The Chicago & Northwestern has abated the nuisance on sixty-four locomotives and 166 stationary boilers in its depots, office building and shops. The Pittsburg, Chicago & St. Louis on eighteen locomotives, one boiler in its shop, and has contracted to equip all other engines running into Chicago. The Pittsburg, Ft. Wayne & Chicago has ten locomotives equipped. The Chicago & Northern Pacific engaged equipping all its locomotives running into the city. The Lake Shore & Michigan Southern has equipped sixty-eight, and that number comprises all the locomotives running into the city, including passenger, freight and switch engines. The Chicago, Rock Island & Pacific has equipped twenty-four locomotives with new devices and repaired thirty-six old ones, some of them having been in use for the past six years, and has equipped the boilers at its elevators A and B. The New York, Chicago & St. Louis has equipped eight locomotives and contracted for ten more which will cover all the engines this road has running into the city. The Chicago & Erie has equipped eighteen, and has assured the department that it will continue the good work until all the engines running into the city stop their smoke. The Chicago & Grand Trunk is now engaged equipping all its engines running into the city; it has seven equipped and has promised to finish them all before summer. The Belt Road has equipped three locomotives and the boilers at the Dearborn street station. The Chicago & Eastern Illinois has equipped nine new and repaired sixteen that has been in use several years. The Baltimore & Ohio has all its engines equipped running in the city, thirty-five in number, and reports them being highly pleased with the results. The Illinois Central has succeeded in stopping the smoke on twelve of its engines and promises a complete abatement of the smoke nuisance in the near future. The Michigan Central is engaged upon thirty-nine of its engines running into the city, and has thirteen of them already working satisfactory. These results are very satisfactory, and establish beyond a question that it is practical to abate the smoke nnisance. Many of the other roads running into the city have made experiments during the past year, but have reported little progress and a good many failures. This department has decided that sufficient time has been given to those who have not yet complied with the ordinance and a vigorous prosecution will be commenced against those who have neglected or refused to comply. Much more has been accomplished in abating the nuisance in factories, hotels and office buildings, a report of which will soon be ready for publication and which we speak of in another article.

NOTES AND NEWS.

The College of Physicians and Surgeons of New York has become the Medical Department of Columbia college.

Nebraska is wrestling with a proposed act establishing a State Board of Health; which, incidentally, is to have control of the registration of physicians.

The Marion County (Ohio) Medical Society recently decided to ask the Legislature to enact a law prohibiting druggists from refilling prescriptions unless ordered by the prescribing physician.

The plan of using gas in small electric arcs to increase their power at a less expense than that of extra current has been effectively carried out by means of hollow carbons. An added

cost of 6 per cent is said to give in this way a light equal to one and one-half times that of the ordinary lamp.

The bacilli of diphtheria preserve their vitality for four and five months in particles of membrane in dry condition. For this reason, all objects which may have come in contact with the excretions of diphtheritics, such as linen, bedding, drinking and eating utensils, clothing of the nurses, etc., should be disinfected by boiling in water, or treatment with water vapor of 100 deg. C. Rooms which have been occupied by diphtheritics should be disinfected with the same carefulness. The flooring should be washed up repeatedly with hot sublimate solution (1:1000), walls and furniture should be rubbed with bread.

People are willing and eager to speak in warmest praise of the physician who has brought them safely through some awful crisis of disease; and rightly. But how seldom do they recognize or appreciate that greater skill which detects disease in its early stages, and so promptly and wisely treats it that the patient does not go down into the shadow of death, says the *Healthy Home*. The greatest skill is habitually displayed in treating the every day ailments, so commonly regarded as trivial and unimportant; and almost every physician of large experience will tell you that much of his best work passes unrecognized and unthought of. Indeed, his greatest, many times his only, reward comes from the consciousness of a good work well done.

A correspondent of *Anthony's Photographic Bulletin*, who believes that the mortality by phthisis was exceptionally light among daguerreotypists in years gone by, propose to institute an inquiry among the survivors of the now little-used method, daguerreotypy, in order to test the truth of his belief. His personal experience has led him to the opinion that the vapors developed by the use of iodine, bromine and mercury in the dark room, forming the iodide and bromide of mercury in a nascent condition, together with the uncombined vapors of those chemicals, sufficed to prevent and cure tuberculosis among his fellow craftsmen, and that those same agents may be turned to good account now for the destruction of bacilli of Koch. Old daguerreotypers are invited to communicate their facts to the above named journal.

Dr. J. G. Orton, ex-president of the New York State Medical Association, has offered a prize of $100 for the best short popular essay on some subject connected with practical sanitation, under the following conditions: 1. Competition to be open to all. 2. Essays to be forwarded to the secretary of the association, Dr. E. D. Ferguson, Troy, N. Y., not later than Aug. 1st, 1891, accompanied by the name of the author under separate seal. 3. Examination and award to be made by a committee appointed by the council of the association. 4. The successful essay to be read at the next annual meeting of the association, and if approved by the council, to be offered for publication in the secular press, and issued in tract form or otherwise for general circulation. 5. Authors of essays, unsuccessful as far as the prize is concerned, but found worthy of special commendation, to receive intimation as to the proper disposition to be made of them.

Researches and experiments published by Rich. Stern in *Zeitsch. f. Hygiene* have given the following results: The bacteria bearing dust particles in a room settle down on the floor when the air is quiet; within one-half hour the air is almost free of germs. The floor then being washed up with some antiseptic fluid and the furniture being wiped with a moist cloth, the room may be considered disinfected. Ventilation alone, which produces about a fourfold renovation of the quantity of air contained in the room in the course of an hour, has no considerable influence on the removal of germs. Only a strong draught, causing the air of the room to be changed at least seven times in an hour, has the power of expelling the germs rapidly and completely. Experiments undertaken with a view of percipitating the germs more rapidly by means of aqueous vapor, failed to give favorable results. Germs attached to the floor, furniture and paper-hangings are not removed even by strong currents of air; they have to be removed by special disinfection.

Friends of the American Economic Association have contributed $500 for prizes for the first and second best essays on "Housing of the Poor in American Cities," the first prize to be $300 and the second prize $200. The essays should describe the actual condition of the dwellings of the poor, especially of the wage-earning classes, a comparison of the present condition with the condition of the past, showing tendency toward improvement or deterioration as the case may be. Voluntary and legislative efforts to improve the dwellings should be treated. The effects of sanitary legislation should be considered, and plans for improvement discussed. It is desired that the limits of private philanthropy and those of legislation and administration should receive attention. While attention is to be confined chiefly to American cities, foreign cities and their experience may be treated, and any lessons derived therefrom pointed out. The essays should not exceed 25,000 words and must be in the hands of the secretary of the association not later than Nov. 15, 1891. It is desired, but not required, that they should be typewritten. The association reserves the right of publication and copyright of the successful essays, if it desires to publish them. Other essays will be returned if stamps for postage are sent. All inquiries should be addressed to Richard T. Ely, secretary of the American Economic Association, Johns Hopkins University, Baltimore, Md.

THE FILTRATION OF NATURAL WATERS.*

(Continued from page 195)

The experiments of the Massachusetts State Board of Health on the purification of sewage by intermittent filtration which have been carried on at Lawrence for the past two years, under the direction of Hiram F. Mills, the engineer member of the board, have added largely to our knowledge of the conditions governing the purification of nitrogenous organic matter. Here are large tanks, 1-200 of an acre in surface, filled with different materials—coarse sand, fine sand, river silt, muck, garden soil, clay, etc., to the depth of five feet, on which is poured from day to day, sewage in known amount and of known composition. The effluent water from this sewage filtration is collected, measured and analyzed, and the precise amount of purification determined. The result of two year's work at this station will shortly be published in the report of the board now in press. I will at present give one or two of the facts that have been there developed. The purification of the sewage means the complete oxidation of all its organic ingredients both in solution and in suspension, the carbon to carbonic acid, the hydrogen to water, and the nitrogen to nitric acid. The filtering materials best adapted to the purpose are those which are fine enough to retain considerable sewage in their pores, and also plenty of air at the same time.

The body of porous material is, when in good working order, a very delicate machine. It must be coaxed up to its highest efficiency by gradually increasing the amount of sewage. This means, in all probability, that we must develop in the pores of the sand an immense number of bacteria to be constantly on hand in the different layers to attend to the sewage as it reaches them. During the first winter there wae no nitrification in these tanks, and consequently no perfect purification, but on the advent of spring, when the temperature of the effluent water reached 39 deg. F., nitrification began, and has continued ever since, the cold weather of the second winter failing to stop it.

The tank which has given the best results, that is, a good purification of the largest quantity of sewage for a long period, is filled with coarse mortar sand, most of the grains of which average about 0.06 inch in diameter. This has given an effiuent day after day organically as pure as many drinking waters, when receiving sewage at the rate of nearly 60,000 gallons per acre per day.

One would naturally ask why is not this the ideal system of purifications of all surface waters, even those that are not polluted by drainage of any kind but which contain much vegetable suspended matter, and have, in consequence, sometimes a bad odor; or waters which are unattractive in appearance by reason of dissolved coloring matter?

One of the tanks of the Lawrence experiment station has filtered Merrimack water intermittently for more than two years at the rate of 300,000 gallons per acre per day. The filtering material consists of 3 minutes 8 seconds of coarse and fine sand and fine gravel; 10 seconds of yellow sandy loam, and 6 seconds of brown soil in the same position as found on the river bank. During the day the surface of the sand is generally covered with

*By Thomas M. Drown, Member Boston Society Civil Engineers, from the Journal of the Association of Engineering Societies.

a few inches of water, but at night and on Sunday air gets access to the sand. The following figures give the composition of the filtered water during last December, compared with the Merrimack water applied:

	Merrimack River Water. Parts per 100,000.	Filtered Water. Parts per 100,000.
Turbidity	Very slight.	None.
Sediment	Very slight.	None.
Color	0.35	0.0
Odor	Faintly vegetable.	None.
Total solids	4.2	3.5
Loss of ignition	1.6	0.9
Free ammonia	.0015	.0005
Albuminoid ammonia	.0127	.0059
Chlorine	.18	.18
Nitrogen as nitrates	.0124	.0191
Nitrogen as nitrites	None.	None.

The water is free from microscopic organisms, and the bacteria rarely exceed ten or twenty per cubic centimeter, while the water applied has generally a few hundred. During the two years that this tank has been in operation the surface has not been cleaned or disturbed in any way. The slow rate of filtration (being only about one-half an inch an hour per square foot of surface) is due to the considerable amount of very fine material contained in the soil and loam.

But one must bear in mind, in connection with the rate of filtration, that the thoroughness of purification, meaning thereby the oxidation of the organic matter, is much greater in intermittent than in continuous filtration.

This system of intermittent filtration for natural waters has never, I believe, been carried out on the large scale, although the possibility of its being practicable in some localities has been discussed. It is the system that nature suggests, for it is intermittent filtration which supplies the springs which furnish the ideally pure and perfect drinking water. In the report of the Massachusetts State Board of Health to the Springfield water board with regard to the purification of the water of its Ludlow reservoir, which contains an immense growth of blue-green algæ, Mr. Stearns, the chief engineer of the board, suggested that surveys be made to discover, if possible, suitable ground, conveniently situated, on which to pour intermittently the water of the reservoir and to collect it again at lower levels in wells and springs. It is probable that continuous filtration would be inapplicable to water of this kind, for the jelly-like masses which are secreted by these algæ would probably close the pores of the filter in a very short time. With intermittent filtration the deposit of organic matter in the pores of the sand would dry out or become oxidized when the ground was more or less dry.

It has been to many a difficult matter to explain how filters working continuously, and constantly covered with water, could intercept objects so much smaller than the spaces between the particles of sand. It was easy to imagine that some of the minute suspended particles might be caught between the particles of sand, but that practically all the suspended matter, even the minute bacteria, could be removed in a good working filter, seemed to indicate that the efficient working of a filter depended on the fact that it became nearly clogged on the surface by the algæ and other matter which held back even the smallest objects. But if this were the case it would save time to use a finer sand at the outset, which experiment shows will not accomplish the purpose.

Piefke has given us the clearest conception of the action of sand filters in removing the suspended matters, including bacteria, from surface waters. The chemical effect is very slight, as might be supposed when one reflects that the duration of the passage of water through the sand seldom, if ever, exceeds five and one-half hours, and, since the filter is kept constantly covered, there is no oxygen present but that dissolved in the water. But the mechanical effect in removing suspended matter—mineral and organic—is very great. The Spree water, which forms part of the supply of Berlin, contains as high as 100,000 bacteria per cubic centimeter at times, and the number in the filtered water rarely exceeds 100, that is, the reduction in bacteria may reach 99.9 per cent. The thickness of the sand layer is generally from two minutes to three minutes and this rests on a layer of coarser gravel, which is without any effect on the filtration. The size of the sand is seldom finer than one-fiftieth of an inch, which leaves channels between the grains that 500 micro-organisms could pass abreast. Smaller still are the particles of clay which give a milkiness to water, and yet when one of these sand filters is working well, both clay and bacteria are held back in the sand.

It takes a new filter about two weeks to get to its maximum efficiency, and if the sand be first carefully cleaned and sterilized by heat, then it takes much longer, many weeks, before the filter works well.

On examining with the microscope the surfaces of the particles of sand when the filter is in perfect working order, they are found to be coated with a greasy, slimy substance, which is a mass of bacteria jelly. Piefke found in a kilogram of sand taken from the surface of a filter 5,600,000,000 bacteria; just below the surface 734,000,000, and at the depth of a foot 92,000,000. These numbers he says are far below the truth, because of the difficulty of cleaning the particles of sand thoroughly. It is to this coating of bacteria jelly that Piefke attributes the efficiency of these filters, and until the jelly forms in sufficient amount to completely envelop each particle of sand, the filters work imperfectly. This, then, is his explanation of the fact that minute micro-organisms and particles of clay of infinitely smaller size than the channels in the sand are stopped in their passage through it—they are simply caught in this slimy coating and cannot get further.

A filter of this kind is, like that used in intermittent filtration, a very delicate instrument and it is very easy to disarrange it. Disturbance of the sand or suddenly increasing the pressure of the water may have, as a consequence, a rush of bacteria into the filtered water. Quite regular working is an essential condition of success. The rate of filtration is on an average only four inches vertically an hour, so that in the passage of the water through the sand, one-third of which is interstitial space, its rate is three times as great, or twelve inches an hour, and the sand layer being two feet thick, the water is in contact with the sand only two hours. In very turbid waters or waters very high in bacteria the filtration is often decreased to one-half this rate or even less, and in comparatively clear water, with low bacteria, the rate may be doubled. The working of the filters in Berlin is governed entirely by the number of the bacteria in the filtered water, this being the simplest way of judging of the efficiency of their working. One hundred bacteria per cubic centimeter in the filtered water is considered a good result on the Spree water, which contains always many thousands. To give practically sterile water would require a diminished rate, say, to one vertical inch an hour, which would be impracticable without enlarging the filtering plant.

(Concluded next week.)

CELEBRATION OF THE BEGINNING OF THE SECOND CENTURY OF THE AMERICAN PATENT SYSTEM.

We are indebted to Mr. Edward T. Fenwick, patent lawyer and solicitor, of Washington, D. C., for the following article:

The completion of the first century of the American patent system marks so important an epoch in the history of the nation that it is eminently proper that the beginning of the second shall not pass unnoticed.

The centennial anniversaries of other important national events have been celebrated in a manner worthy of a people proud of their country and its growth. Surely the system that has aided the agriculturist in the field, the mechanic in the shop and the toiler in the mine, that has stimulated invention and helped every branch of modern industry, has played no small part in a history so full of the triumphs of human achievement.

Believing that the American inventor and manufacturer of inventions will regard it a privilege as well as a duty to co-operate in making due recognition of these facts, it is proposed to hold a celebration at the national capital in April, 1891, which shall in a fitting manner commemorate the important event, and place on record the nation's appreciation of the labors of those whose ingenuity, patience and tireless efforts have exercised such a potent influence in accelerating the prosperous growth of the nation, and in aiding the progress of our civilization.

The necessity of a National Association of Inventors, organized for mutual benefit, has been frequently discussed in the technical and other journals. No time could be more opportune for the formation of such an association than when men from every

part of the country meet to celebrate so important an anniversary. Surely the occasion is most inspiring. This announcement by the secretary, Mr. J. Elfreth Watkins, of the Central Committee, is a clear index of what is to be expected on this occasion.

The Central Committee is composed of Messrs. John W. Babson, Robt. W. Fenwick, B. H. Warner, Prof. Otis T. Mason, M. M. Parker, Hon. John Lynch, M. C. Stone and J. Elfreth Watkins—representing the most prominent business interests in Washington. This committee has the earnest co-operation of Senators Platt and Teller, Representative Butterworth and other members of the Congressional Patent Committee; and Hon. C. E. Mitchell, Commissioner of Patents; Dr. G. Brown Goode, curator at the National Museum; Hon. A. R. Spofford, Congressional Librarian, and many other of the officials of the Government departments.

Commodious rooms for the meetings of the various committees, with telephone service, have been provided, and clerks are busily engaged sending out communications to inventors, manufacturers and members of Congress, with the view of obtaining information as to the most suitable men to be appointed from the different states of the Union as delegates or representatives to the Centennial Celebration.

The responses are indicicative of great interest being manifested by leading inventors of the country, as well as manufacturers of patented articles. Among the many letters of approval received by the committee is one from Mr. Thomas A. Edison, the great electrical inventor, saying: "I am in hearty sympathy with the movement." Prof. Alex. Graham Bell, inventor and patentee of the telephone, has signified his willingness to preside at one of the meetings of the centennial celebration. The President of the United States will preside at the opening exercises. Hon. John W. Noble, Secretary of the Interior; Hon. Frederick Fraley, LL. D., and Prof. S. P. Langley, LL. D., will also preside at different meetings.

The Committee on Literature, consisting of Dr. G. Brown Goode, chairman, Hon. A. R. Spofford, and L. Dean, Esq., have arranged the following order of exercises, which would be difficult to excel, and which will prove one of the greatest literary treats of the Nineteenth Century:

FIRST PUBLIC MEETING, AFTERNOON, APRIL 8TH, 1891.

To be presided over by the President of the United States.

SECOND PUBLIC MEETING, APRIL 8TH, 7 TO 8:30 P. M.

To be presided over by Hon. J. W. Noble, Secretary of the Interior.

SPECIAL RECEPTION TO INVENTORS AND MANUFACTURERS,

and the ladies who accompany them, at the Patent Office, April 8th, 9 to 11:30 P. M., by the Hon. J. W. Noble, Secretary of the Interior, and the Hon. C. E. Mitchell, Commissioner of Patents.

THIRD PUBLIC MEETING, AFTERNOON, APRIL 9TH, 1891.

To be presided over by the Hon. Frederick Fraley, LL. D., President of the National Board of Trade and the American Philosophical Society, and charter member of Franklin Institute.

FOURTH PUBLIC MEETING, EVENING, APRIL 9TH, 1891.

To be presided over by Prof. S. B. Langley, LL. D., Secretary of the Smithsonian Institute.

ANNIVERSARY DAY, APRIL 10TH, 1891.

Anniversary of the signing of the first American patent law—"An act to promote the progress of the useful arts"—by George Washington.

Excursion to Mount Vernon, 10 A. M., where an address will be delivered by J. M. Toner, M. D., of Washington, upon "Washington as an Inventor and Promoter of Improvements."

FIFTH PUBLIC MEETING, APRIL 10TH, 1891.

To be presided over by Prof. A. Graham Bell.

Addresses upon the following subjects are promised at the public meetings:

Edward Atkinson, Ph. D., LL. D., of Massachusetts: Invention in its Effects upon Household Economy.

Dr. John S. Billings, Curator U. S. Army Medical Museum: American Inventions and Discoveries in Medical Surgery and Practical Sanitation.

Hon. Samuel Blatchford, Justice of the Supreme Court of the United States: A Century of Patent Law.

Cyrus F. Brackett, M. D., LL. D., of New Jersey, Henry Professor of Physics, College of New Jersey Princeton: The Effect of Invention upon the Progress of Electrical Science.

Hon. Benj. Butterworth, Ohio, U. S. House of Representatives: The Effect of our Patent System on the Material Development of the United States.

Octave Chanute, of Illinois, President of the American Society of Civil Engineers: The Effect of Inventions upon the Railroad and Other Means of Intercommunication.

Prof. F. W. Clarke, S. B, of Ohio, Chief Chemist Geological Survey: The Relation of Abstract Scientific Research to Practical Invention, with Special Reference to Chemistry and Physics.

Hon. John W. Daniel, of Virginia, U. S. Senator: The New South as an Outgrowth of Invention and the American Patent Law.

Major C. E. Dutton, Ordnance Department, U. S. A.: The Influence of Invention upon the Implements and Munitions of Modern Warfare.

Thomas Gray, C. E. B. Society, F. R. S. E., of Indiana, Professor of Dynamic Engineering, Rose Polytechnic Institution, Terre Haute: The Inventors of the Telegraph and Telephone.

Prof. Otis T. Mason, Ph. D., of Virginia, Curator U. S. National Museum: The Birth of Invention.

Hon. C. E. Mitchell, of Connecticut, Commissioner of Patents: The Birth and Growth of the American Patent System.

Hon. O. H. Platt, of Connecticut, U. S. Senator: Invention and Advancement.

Col. F. A. Seeley, of Pennsylvania, Principal Examiner, U. S. Patent Office: International Protection of Industrial Property.

Hon. A. R. Spofford, LL. D., Librarian U. S. Congress: The Copyright System of the United States; Its Origin and Growth.

Hon. Robert S. Taylor, of Indiana: The Epoch-Making Inventions of America.

Robert H. Thurston, A. M., LL. D., Doc. Eng., of New York, Director and Professor of Mechanical Engineering, Sibley College, Cornell University: The Inventors of the Steam Engine.

W. P. Trowbridge, Ph. D., LL. D., of New York, Professor of Engineering, School of Mines, Columbia College: The Effect of Technological Schools upon the Progress of Inventions.

Hon. Edwin Willits, of Michigan, Assistant Secretary of Agriculture: The Relation of Invention to Agriculture.

Hon. Carroll D. Wright, M. A., of Washington, Commissioner of Labor: The Relation of Invention to Labor.

Committees on Reception, Public Comfort, Transportation and Finances have been appointed, and are actively engaged making reasonable terms with hotels, private boarding-houses and railroad companies, and arranging for a right royal reception to visitors, and in obtaining contributions from the citizens of Washington and the country at large to defray the expenses attending the renting of committee-rooms, public halls, and the printing and circulation of information throughout the United States; but more especially are these funds solicited for the publication of two or more handsomely printed volumes of 500 pages each, which shall contain the addresses delivered by the eminent statesmen, political economists and scientists, together with a series of biographies of the greatest American inventors and manufacturers of their inventions. The treasurer of the Finance Committee is the Hon. A. T. Britton, president of the American Security and Trust Co.; chairman of the Reception Committee is W. Cranch McIntyre, Esq.; chairman of the Committee of Public Comfort, W. C. Dodge, Esq.; with subcommittees on hotels, J. H. Whitaker, Esq., chairman; and on private boarding-houses, E. T. Fenwick, chairman.

It is hoped that inventors and manufacturers in your section will take a deep interest in the promotion of the celebration of this important event of our country's history.

EDWARD T. FENWICK.

COMFORTABLE AND HEALTHY HOUSES.

A large proportion of the colds and ailments of the respiratory organs are attributable to the want of proper measures being taken by builders in laying foundations and in constructing the basement of houses, says the London *News*. Hundreds of the houses in suburban districts are built upon clay and marshy ground, often of "made earth" and rubbish; the foundations being laid on the damp soil without concrete or proper courses to prevent the rising of damp in them.

A few of the causes which contribute to cold and uncomfortable houses is the imperfect arrest of dampness from the soil. The only way of securing a healthful house is to cut it off as much as possible from the soil on which it stands. Ideally, one may imagine a house standing on stilts or piers, having a free current of air below, and a stair up to the floor; but this would be unattainable under existing arrangements. The next best thing is to obtain a well ventilated cellar, or what is almost as good, a sufficient air space between the ground and the floor, this space being well ventilated and the ground covered with asphalt or concrete. There is an air space below the floor; but it is generally a rough and unleveled surface of rubbish, with air passages so scantily introduced, and often clogged up that the air is in a state of stagnation, and the emanations from the soil are sucked up into the house by the warmth and fires, particularly if hot air furnaces are used. Another danger is added if a cesspool is near the house. Many of the houses and tenements built almost level with the ground are particularly open to suspicion. A fast decaying floor or a mildewed appearance of dampness, or a musty smell under oilcloth or linoleum in the hall or passage will reveal the evil. On examination it is found, on taking rotten boards up, that the joists are close to or rest on the ground, that the bond timber is rotten, or no damp-proof course inserted. Hundreds of small houses are found nearly in this condition of incipient decay, which often begins under the passage floor, near the staircase or back door. The only remedy is to excavate the soil, underpin the walls, and lay a damp course over-soil, replacing the timber on sleeper walls of proper construction. The want of ventilation is usually found to be the cause. Houses having half basements below the ground floor are very common, but these as living rooms are highly objectionable.

Speaking of half basements one or two points connected with dry areas require a word of caution. A wall built against earth ought to have an area formed along it of its whole height. On the return side of semi-detached houses the side wall must be built often without any area, and in this case the space next the wall for a foot or more should be filled in with broken stone, and a drain be placed at the bottom just below the level of the footing. An asphalt coat should invariably be put on the outer face of a wall returning in the joint at the floor level. A more efficient protection would be an area covered over next the outer wall, called a "French intercepting drain," or a concealed area. Sometimes an impervious tile facing has been placed against the outer face of a wall so built; but of all these plans the open ventilation area is the best. We have here referred chiefly to foundation and basement measures; but the dry wall and well protected roof are other necessaries of warm and healthful dwellinghouses.

PLUMBING IN THE WHITE HOUSE.

The following is a report of the plumbing inspector of Washington, D. C., concerning the sanitary condition of the White House:

To the Honorable Commissioners, D. C.—Gentlemen: I have made an inspection of the drainage and plumbing in the executive mansion by request of Col. O. H. Ernst, Commissioner of Public Buildings and Grounds. The position of the several plumbing fixtures and the arrangement of the lines of soil and waste pipes is exceedingly simple, and I made no suggestion for their alteration. These drains appear to be free of defective joints upon the peppermint test being made in the usual careful manner practiced by this office, and the provision for flushing the fixtures is sufficient to keep the drains free of obstruction. Each line of waste pipe, as it reaches the basement, is carried directly through the outside wall into the main drain, and running traps, with fresh air inlets, are conveniently located. The fresh-air pipes, however, instead of being four inches, are only two inches in diameter, and I recommend their enlargement to secure more efficient ventilation of house drains.

The test of peppermint indicated a leak under the water closet on second floor directly opposite the elevator, and I recommend that this closet be reset, and the joint with the drain be securely made.

There are several ball traps used on the smaller waste pipes and these should be opened carefully and cleaned at regular intervals, at least twice a year,—they now require attention.

The water closet in bath room, in south-west corner on second floor, is imperfect in operation, and I think a new closet of same class, but of more modern construction should be supplied. Although the ball traps under the smaller fixtures in this bath room cannot easily be unsealed, they should be ventilated by means of a two-inch pipe directly to the roof, in order to afford a circulation of air through the lines of lateral waste pipes.

The bath tubs throughout the house are of wood with copper linings, and all the surrounding surfaces are of wood. The basins are surrounded with cabinet finished closets, receptacles for dust and dirt, in the style commonly in use twenty-five years ago. The bath rooms are either unventilated or inadequately ventilated and have a close, stuffy odor unavoidable under such conditions. I cannot say less than to recommend that all bath tubs be replaced by ceremic or enameled tubs and all wood work be removed from about the basins, and the floors and walls about all plumbing fixtures be made non-absorbent by being laid in glazed tile, and that efficient vent shafts of ample area for the positive ventilation of these rooms be provided. This is no greater precaution than is now commonly practiced in private residences, and in the present state of the art of sanitation, most people who could command the means for making a change would not submit to the objectionable conditions existing in the White House.

There appears to be considerable pollution of the floor and walls about the servants' water-closet in basement. This fixture, I think, is badly located, and as it is used a great deal by persons not permanently employed in the house, it might be removed to the outside of house. If allowed to remain, it is evident that a greater number, as well as better construction, should be provided, with non-absorbent surroundings. There is a peculiar unpleasant odor throughout the basement, the cause of which may be reasonably accounted for as follows:

The laundry, which is quite an extensive affair, is located here in an unventilated apartment, and wooden tubs are used instead of tubs of non-absorbent material. Much of the floor of the basement is of porous sandstone slabs, which were laid when the house was built; and, while holding much impurity, are no protection against ground air. The entire basement floor should be removed and resurfaced with hydraulic cement.

The wood work about the pantry sink should be removed, and the dark unventilated closets in the basement, especially under the stairway, leading from the basement to the second floor, should be opened up to light and air.

To entirely eradicate the disagreeable smell of the basement it may be necessary to remove much or all of the plastering and renew with non-absorbent material. Very respectfully, your obedient servant,

Samuel A. Robinson, Inspector of Plumbing.

"THIS, THAT AND THE OTHER."

Detroit, Mich., Feb. 21, 1891.—Editor The Sanitary News: Your recently published opinion of Dr. H. W. Longyear, of this city, on the sanitary needs of Detroit, is but one of the doctor's expressions along that line, and was called forth by the mayor's proposed $6,000,000 park in the heart of the business portion of the city. When the mayor proposed bonding the city for public improvements there were some very spirited comments by "prominent citizens," among which was Dr. Longyear's, and for which he deserves thanks. For, had we several more doctors like Dr. Longyear, and a number of sufficiently interested stiff-backed plumbers (not tinkers) to co-operate with the doctors for rigid sanitary control of the city, we might, then, with some particle of reason, claim the title of the "handsomest city," but it is dirty pride on our part now to do so.

The writer has various times through your columns spoken of the rottenness of Detroit plumbing, and has nothing more to say now in its favor than before, except where improved appliances have naturally forced a better quality of workmanship.

Cities are supposed to be democratic, or governed on democratic principles—"a rule of the people"— and yet the Detroit Common Council is controlled by one bull-dozing Teuton who styles himself a "democrat."

So far as the plumbers are concerned, they are ruled by one man in the water office, who possibly cares more for the increased

revenue from the licensing of plumbers and some "would-be" plumbers at $5 per year, than he cares for plumbers and sanitation altogether.

There is something disgusting in the eagerness with which the vulture politician contemplates the control of the water office, police and fire commissioners, now so badly managed, and the sanitary inspection they will have to pass through when controlled by the mayor and the honorable the common council of Detroit.

But, leaving the dirty mire of politics and returning to our legitimate subject, sanitary plumbing, I want to say I have neither time nor has the NEWS space, to record in detail the need of Detroit for sanitary inspection.

Our alleys are filthy; cellars of private residences, stores, and especially saloons, swimming with death-dealing stench from old tin waste pipes, emptying their contents on the ground to soak away or not, and nothing to prevent. There is a prominent dry goods store on the principal avenue of Detroit in a rotten old building that should have been demolished years ago, and where the aroma coming up the stairway from the cellar would knock down an old time plumber.

There is an institution, called "car works," but which in reality is a slaughter house, situated in the western part of the city, where some two to three thousand men are worked like stevedores for ten hours per day, hundreds of them at 90c. per day, and this institution is owned and directed by a U. S. Senator from Michigan, who can give $150,000 for a hospital which, of course, the public hear of, but they don't hear of the filthy surroundings of these men employed at the "car works."

I have read with interest the NEWS' articles on "Back-Venting," pro and con, and agree very decidedly with Mr. Kelley on the question of simple traps, but would at all times have the trap larger than the waste pipe and branched into waste, with waste and vent the direct pipe.

"I could harp upon this theme until my eyelids would no longer wag, "but we will wait coming events, and see what steps are taken for the improvement of Detroit plumbing, but will keep our eye on some things in the meantime. Hoping to advise you ere long that something is going to be done, I remain, yours truly,

JOHN J. BLACKWOOD.

PLUMBING LAW FOR MINNESOTA.

A bill entitled an "act to prevent incompetent persons from working at, or conducting the business of plumbing in the State of Minnesota," is before the Legislature of the state. The present status of the bill will be seen from the following letter from Mr. James H. Doyle, 435 Superior street, St. Paul, Minn., being a reply to a letter addressed him on the subject:

Yours of the 12th to hand. In reply I have the honor to inform you that the bill "To prevent incompetent persons from working at or engaging in the plumbing business in the State of Minnesota," was introduced in the House and was referred to the Committee on Labor, and was reported back by them with the recommendation that it pass. It was read the second and third time, when one of the representatives raised the point that it was not legal in form and requested that the bill be referred to the Judiciary Committee. It was so referred, and is in their hands at present.

The fact that the bill was read the second and third time without creating any adverse criticism, justifies the prediction that it will encounter no serious opposition in the House. I have been unable to ascertain, outside of a few members, what the sentiment in the Senate is in regard to it. The bill has the active support of a large majority of the master plumbers and the journeymen plumbers of the state, and it has the endorsement of the State Federation of Labor, that body regarding it "in the interest of good health and perfect sanitation." The sentiment of the general public is also largely in its favor. All whom we have approached on the subject agree in calling it a just and wise measure, and all express the hope that it will become a law, believing that it is just as important to the public health to have good plumbers as it is to have good physicians.

Following is the text of the bill:

SECTION 1. Be it enacted by the State of Minnesota, That it shall not be lawful for any person, persons, firm or corporation engaged in the plumbing business in the State of Minnesota, to employ as workmen in said business any person, or persons, except those qualified to work as registered plumbers; and no person shall be qualified to work as a registered plumber unless said persons, have made application and received from the State Board of Commissioners of Practical Plumbing a certificate of competency, and has complied with the provisions of this act.

SEC. 2. And be it enacted, That if any person, or persons, after the passage of this act shall engage in, or work at the plumbing business, in the State of Minnesota, without first complying with the provisions of this act, such person shall be deemed guilty of a misdemeanor, and subject to a fine of fifty dollars for each and every violation of said act, said fine to be sued for in the name of the state, and before any qualified Justice of the Peace in the state.

SEC. 3. And be it enacted that the Governor shall appoint biennially five persons, who shall constitute a Board of Commissioners which shall be known and designated as "The State Board of Commissioners of Practical Plumbing," and who shall be selected as follows: Fve practical plumbers, two of whom shall be master plumbers engaged in the plumbing business and resident free-holders of the state; two shall be journeymen plumbers and free-holders of the state; the fifth to be one of the plumbing inspectors of any first class city in the state, possessing the same qualifications; whose duty it shall be to faithfully and impartially execute, or cause to be executed, all the provisions and requirements of this act; that they shall upon application and in such manner and at such place as they may determine, provided said place of examination shall be within the limits of the State of Minnesota, examine each and every person who shall desire to work at the plumbing business, touching his competency and qualifications; and upon being satisfied that the person so examined is competent and qualified to work at said business, they, or any three of them, shall grant such person a certificate of competency, under the provisions of this act, and register him in their books as a practical plumber, which shall operate as full authority to him to conduct and engage in the said business of plumbing.

SEC. 4. And be it enacted, That the commissioners appointed under this act shall hold their several offices for the period of two years, without compensation, commencing from the first day of May, next succeeding the date of the passage of this act, and thereafter until their successors have been appointed and qualified; said commissioners shall, and within thirty days after notification of their appointment, each subscribe to an oath before the Clerk of the Supreme Court of the State of Minnesota, to impartially and faithfully discharge the duties prescribed by this act; a failure to so qualify on the part of any appointee, within the time and manner named, shall create a vacancy, which the Governor shall immediately proceed to fill by the appointment of some other practical plumber as required by the provisions of this act; as also in cases of death or resignation.

SEC. 5. And be it enacted, That the said Board of Commissioners shall demand and receive from each applicant for a certificate of competency, whom they examine and pass, the sum of three dollars at the time of the issuance of said certificate, and the sum of one dollar for the renewal thereof each and every year thereafter, on or before the first day of May, provided that no person who shall be engaged in the general plumbing business at the time of the passage of this act, shall be required to make application for such certificate of competency for the period of one year from the date of the passage of this act, commencing with the first day of May, next succeeding the passage of this act.

SEC. 6. And be it enacted, That the money received under the provisions of the foregoing section shall be used and applied by said commissioners to defray the expenses accruing or arising under this act, and all surplus over and above the necessary expenses under this act shall be returned to the State Treasurer for the use of the state.

Sec. 7. And be it enacted, That the said Board of Commissioners are hereby empowered to make such rules and regulations from time to time, for the proper execution of the provisions of this act, as in their judgment they may deem necessary and requisite; and that they shall be required to make a report of the condition of the Board to the Governor biennally, on or before the first day of February.

Sec. 8. And be it enacted, That this act shall take effect from the date of its passage.

"COMBINATION TRAPS."

Editor The Sanitary News: I have read with considerable interest the articles in The Sanitary News regarding traps, back-venting, syphonage, etc., and, as Mr. Kelley demands the practical experience of plumbers rather than the theory of sanitary experts, I will simply and briefly state some experience of my own. I had long been an advocate of back-venting, and would listen to no argument in favor of "combination traps," as Mr. Kelley terms them, as I was told that they were filthy, liable to syphonage, and generally unreliable.

It so happened in my experience that I plumbed a three-story and basement flat building, using the best method of back-venting, and afterwards occupied one of the lower apartments myself. I felt very comfortable in regard to the reliability of the plumbing; for had I not done the work myself in accordance with the most approved system? But I was not long in the building until I began to study that system and look into it very closely. My attention was first called to the matter by observing a rumbling sound in my wash-basin every time the fixtures above were discharged. I investigated and found that the bubbling sound proceeded from above the back-vented trap, and not below it. I then made experiments and found that at every discharge the basin trap lost a portion, and often all, of its seal. This satisfied me that the plumbing was not right. I examined the vent and found it clear, unobstructed to the top. I removed it at the trap-crown to examine more closely the trap, and found that, with the vent disconnected in this way, the trap did not syphon, nor was the seal at all disturbed by the discharges. I could come to no other conclusion than the length of the vent-pipe, the inertia of the air and the friction along the pipe wholly destroyed the efficacy of the vent, and left the trap subject to the breaking of its seal at every discharge of any of the fixtures connected with the system.

To remedy this plainly discernable evil in my pet plumbing job, I procured a Bower trap, and with it replaced the S-trap and vent It has now been over three years since this was done, and I have a perfect seal all the time, and I have not touched the trap once. I likewise replaced all the traps in the flats, and now live in perfect comfort and security regarding sewer-gas. Since then I have seen this trap tested in every way possible, and it has never failed. I do not wish to be understood as disapproving of other traps of this general character. There are the Cudell, Sanitas, Puro, "Clean-Sweep" and others—all good traps; but I use the Bower because I have found it efficieat. I do not particularly advocate any one trap, but cannot advocate back-venting under all circumstances. In fact, I find few conditions where I would use it at all. The McClellan vent is practical and effective under many conditions, and all these, in the large majority of cases, are to be preferred to the back-vent.

Let us look a little into the reasons for this conclusion, having seen the facts on which it is based. The three principal causes that produce the effect of unsealing a trap are syphonage, evaporation and capillary attraction. In regard to capillary attraction, it is just as likely to occur in a back-vented S-trap as in any other, so in that matter it is a "stand-off;" but when the S-trap has lost its water-seal it has no seal whatever, and its form naturally contributes to capillary action. In the matter of evaporation, we find in the back-vented S-trap about all the conditions necessary for unsealing the trap in this manner. We have changing air in contact with the water-seal, an air-current carrying off the vapor, and air-pressure on the house side of the trap which aerates the whole of the seal, producing the conditions for rapid evaporation. We do not have any of these conditions in the "combination traps."

As regards syphonage, the theory of back-venting is plausible, but the practice is a "vexation of spirits." A short vent-pipe, if large enough, will prevent syphonage; but to find this condition in general plumbing work is very rare. The theory of back-venting includes that of ventilation, and a current of air is supposed to be moving *up* the pipe continually. If we accept a theory in one particular we must in all, and the back-vent, in order to prevent syphonage, must have this current of air reversed and made to rush *down* the pipe. Here we have to overcome this ascending velocity of the air, its dead weight, and the frictional resistance of the pipe. I have found to my own satisfaction that all this resistance is greater than that of the seal and short pipe to fixture, and the seal gives way first.

In conclusion I wish to state that back-venting is efficient where the length of pipe and its size afford a less resistance than the water-seal; but when this is passed, which is the case in the majority of buildings, this system is ineffective, and a resort to a "combination trap" seems to me to be wise. A. J. T.

FLOOR SPACE.

As land gets more and more valuable—at any rate, dearer and dearer—it is desirable that more attention should be paid to economizing floor-space. This is particularly the case in "flats" and in houses on narrow lots. Taking the average flat, or small city houses, there is scarcely a room in which the builder could not make more floor room without increasing the floor area.

To start with the kitchen, it may be mentioned that the boiler is usually an upright fixture, supported near the floor on an iron stand placed near to the range. Turn the boiler on its side and perch it above the range, and floor-space will be gained. The manner of setting may be such as to give greater heating capacity than with the upright arrangement.

The dresser, generally, is so arranged as to give the least holding capacity for a given floor-space. It could be run up further toward the ceiling and made deeper toward the top—in fact given an overhang—and thus made to hold just as many pots, pans and dishes as before in two-thirds the length, and but two-thirds the floor-space. The sink, when boxed in, offers a premium on carelessness. With the casing removed it gives more floor-room, and with the usual curved iron legs replaced by light brackets, the arrangement is better yet. Stout shelves over the range, the door and the window, will make a kitchen practically larger.

In the dining-room there is always experienced difficulty in finding room for a buffet or old-fashioned sideboard. The designer can put over a mantel-piece a buffet which will be at once an ornament and a convenience, and thus increase the floor-space.

In bed-rooms, closets which run clear up to the ceiling may be made narrower than when they stop at the seventh-foot line. An extra wide window-sill often does away with the necessity for a small table, and thus increases the floor-room.

Where standing bedsteads are used, there should be made under them a pair of large, deep drawers for holding extra pillows, bed-clothing, etc., and that relieves pressure on the other closets in the house. Over stationary washstands, cupboards should be built.

In the parlor, appropriate cabinet finish over the mantelpiece provides suitable place for the display of bric-a-brac, without taking up floor-space with chiffoniers.

In the library, overhead shelving for seldom-consulted books would be as equally economical of space as the present "low-down" cases are wasteful thereof.

All through the house, sliding doors save floor-space, where hinged ones would waste it.

A bay window adds materially to the area of the room, particularly a chamber or dining room.

PLUMBING NOTES.

Gay & Culloten have lit into a rushing business at their new show-rooms, recently fitted up at 52 N. Clark street.

New plumbing-shops spring up along with other improvements south on Wabash avenue.

The plumber receives 22½ cents an hour at Vicksburg, 39 cents at New York and San Francisco, and 40 cents at Chicago. We believe Chicago pays the highest wages paid.

James B. Clow & Son have placed on the market a new invention in the way of a lawn sprinkler which is efficient in every particular and retails at only $2.50.

The late cold snap in England gave a practical turn to the discussion regarding the placing of soil-pipes inside the houses.

J. J. Wade & Son, this city, are experiencing a season of brisk business.

By inspection it was found that, in the tailors' work-rooms in New York, the flush was supplied to water-closets by a hand-pump, which the individual is supposed to operate. About all other sanitary arrangements were as bad, and a most filthy state of affairs was discovered.

It will pay plumbers to arrange handsome show windows where their specialties may be seen as the people pass by. An appeal to the eye is a successful way of strongly impressing the mind.

The English plumbers are discussing the use of the disconnecting trap. While advocates are to be found on both sides of the question, the majority seem to be in favor of its use.

An ordinance is in course of preparation designed to embrace the state law of Illinois regarding plumbing in Chicago in the ordinances of the city. As it now stands the legal machinery of the state must be resorted to in order to enforce the law, and a great deal of trouble and delay may be the result.

The trouble in Salt Lake City has not reached a settlement yet. A firm claims the right to employ any man they desire regardless of unions, while the union men claim their demands are in accordance with the principles on which their order is based and cannot be withdrawn.

The authorities at Birmingham, Ala., have by ordinance adopted an improved system of plumbing which has met with some opposition from the leading plumbers owing to a change in appliances and material to be used.

There seems to be some good reasons for the appointment of plumbers as inspectors at Elmira, and a movement of the plumbers in this direction will probably result in this important feature in the sanitary interests of that city.

The Portland (Ore.) Master Plumbers have elected the following officers: President—Alexander Muirhead; Vice-President—Robert Brady; Treasurer—August Dormerberg; Secretary—A. J. Lawrence. Trustees—Wm. Muirhead, John Hannaford and E. L. Floyd.

Peck Bros. & Co., 284 Wabash avenue, are preparing a new catalogue which will be issued shortly.

When old hoary winter lingers
In the lap of coy young spring,
Then the plumber's heart is happy
And the shops with music ring.

TRADE AND BUSINESS NOTES.

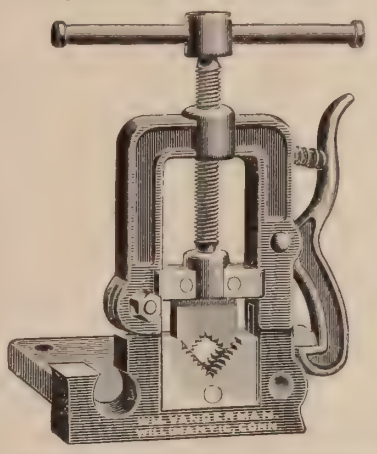
LAWN-SPRINKLER.

James B. Clow & Son, corner Lake and Franklin streets, Chicago, have supplied a need in their production of a lawn-sprinkler which will take the place of the large, clumsy, high-priced ones which are occasionally seen in yards, standing about in the way. A beautiful yard is almost an impossibillty without the use of a sprinkler, as will be seen by observing the lawns of Chicago any summer. The accompanying cut fully illustrates this sprinkler, and speaks for itself.

This sprinkler, while small and very handy, is of full service, as it throws the water thirty feet, and the cut illustrates the manner. It is placed in reach of all, its retail price being only $2.50, which will add to its effectiveness in making it popular.

The Globe Company, of Cincinnati, have issued a catalogue, handsomely illustrated with their high-grade office furniture, consisting of cabinets, files, indexes, book-cases, desks, chairs, stools, and all office specialties. Their motto is, "Honest goods at honest prices." They are not in competition with cheap and unreliable manufacturers, but produce a class of office appliances that is of standard and reliable make and reasonable price.

The accompanying cut represents Vandeman's patent pipe vise. It will take pipe ⅛ to 2½ inches, with bending forms to bend pipe from ⅛ to 1 inch. The cut illustrates the valuable features of the vise, and its practical utility can be seen at once. The two bending forms in the vise will be found a very useful feature, and their value will be appreciated by their use. The forms do not in any way interfere with the pipe-jaws or the strength of the vise. The form on left of vise has a flat surface on top, which makes a handy place to hammer on. The pipe-jaws are made from best tool steel, and can be sharpened or duplicated. Weight, 18 pounds. The vise is manufactured and for sale by William Vandeman, Willimantic, Conn., and is handled by dealers in plumbers', steam and gas fitters' supplies.



J. A. Cunningham, Jr., representing the Smith & Anthony Company of Boston, proprietors of the Sanitas Manufacturing Co., is general manager in this city for the Marshall patent spiral stairway fire-escape. This escape consists of a circular stairway made entirely of iron, and is located between windows, with connecting balconies at each story, so constructed as to afford easy and safe means of escape to old and young in case of fire. The stairway is rendered entirely safe by a substantial railing, neat in appearance, which prevents accidents by falling. The stand-pipe is a special feature, being the center column to the stairway, and made of heavy wrought-iron pipe with hose-valves at each balcony and roof of building, and at base of the stairway a Siamese valve for two hose connections. The escape has been extensively introduced, and Mr. Cunningham is now figuring on placing it on the city building. He has a good line of sanitary specialties, and represents a large, strong firm in the Smith & Anthony Company. His office is at 219 Lake street, Chicago, where any information concerning the interests he represents can be obtained.

At the present rate seventy years will be required to unearth Pompeii.

A plate was rolled in Pittsburg thirty inches wide by eighty-five feet long, seven-eights inch thick, weighing 7,480 pounds.

If a box six feet wide were filled with sea water and allowed to evaporate under the sun, there would be two inches of salt left at the bottom.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Philadelphia, Pa.: Architects Brown & Day have plans in hand for an addition to the building, 914 Walnut street, occupied by the Fidelity Mutual Life Insurance Co. A five-story warehouse will soon be built by Paxson, Comport & Co. Two large three-story houses will be built at 1047–1049 South Fifth street, by M. Jennings. Henry Lente will build four dwellings on the west side of Helen street, south of Somerset, and a large shop on the east side of Jasper street, south of Somerset. A machine shop, three stories high, 46x20, will soon be built by W. H. H. Heydrick, on the southeast side of Springfield avenue, south of Willow Grove avenue. A club-house, costing $75,000, will be built by the Anti-Cobden Club. Committees have been appointed to select a proper site for the proposed building, and to outline plans for the structure. On the east side of Orchard street, north of Tacony, three houses will soon be erected by F. M. Forsyth. German citizens residing west of the Schuylkill have formed an organization called the "Twin Section," which will erect a building after the plan of Mænnerchor Hall. Dr. J. S. Ellenger is chairman of the committee. Contractor Philip Harback will build a one-story factory-building, 48x50, at Adams street and Trenton avenue. Eight dwellings will be erected on the north side of Fairmont avenue, east of Fiftieth street, by B. Ketcham & Sons. R. W. Kriner will build four houses on the east side of Miller street, north of Clearfield.—Augusta, Ga.: The Commercial Club has appointed a committee to secure plans for a club-house to be erected on Broad street, at a cost of $30,000.——Macon, Ga.: O. P. & B. E. Willingham will erect a five-story building.——Lexington, Ky.: J. R. Howard is at the head of a company which will erect from thirty to thirty-five houses, costing from $800 to $3,000.——Holyoke, Mass.: High, corner Cabot street, block of four stores; owner, Arthur Perault. Pearl street, two-tenement frame house; owner, J. B. Williams. Brick church for the First Congregational Society. G. P. B. Alderman, architect. Lyman street, five-story brick addition to the Lyman Mills, 84x150; cost, $50,000. Contractor, Casper Ranger.——Monson, Mass.: Frame creamery building. Contractor, Thomas J. Mills.——Manchester, N. H.: J. W. C. Pickering, of Lowell, is having plans made for a six-story building.——Milford, N. H.: A new library, fire department and Masonic rooms, in one large building, is to be built. Plans by F. W. Stickney.——Charlotte, N. C.: Three-story hotel by the Charlotte Consolidated Construction Company; E. D. Latta, of Charlotte, president.——New Berne, N. C.: A new city hall is to be built, at a cost of $15,000. Address Alex. Miller.——Eau Clare, Wis.: Plans have been prepared for a large hotel, to be erected by Messrs. A. A. Cutter and Capt. Matthew W. Harns.——Bridgeport, Conn.; Mr. Barnum has decided to begin the $50,000 building for the Scientific and Historical Societies. Plans are being figured for E. Greenstein's new four-family house on James street. Architect A. Murray Jenks is planning a two-family frame house on James street, for Mary and Maggie O'Toole.——Hartford, Conn.: Architect B. M. Lincoln is preparing plans for a block of six flats, to be erected on High street by A. Hollander. The Society for Savings has invited competition designs for their new banking-house from Peabody & Stearns, of Boston, Cady & Co. and R. W. Gibson, of New York.——New Haven, Conn.: The members of St. Andrew's Brotherhood Mission have decided to erect a church edifice on Ivy street, near Shelton avenue.——Waterbury, Conn.: Architect Joseph A. Jackson has plans for a business block to be built on Bank street, near the Franklin House, between Grand and Meadow streets.——Baltimore, Md.: Architect Alfred Mason has plans for a factory and store, to be erected corner St. Paul and Saratoga streets, for Schneider & Fuchs; cost, $30,000. James B. Yeatman, contractor.——Architect W. H. Marriott has plans for the Fourth Baptist church, to be erected on Broadway, opposite John Hopkins' Hospital; cost, $10,000. Also plans for a colored church, to be erected on Perkins Square; cost, $10,000. Architect Benj. B. Owens has plans for fifty small dwellings, to be erected at Sparrows Point, Md., for the Pennsylvania Steel Company; cost, $75,000.——Cincinnati, O.: Mr. Frederick Alms will erect a six-story apartment house on McMillan street, at the head of Elm street, to cost $100,000; new hotel, to cost $28,000. W. H. Mayer, 28 West Court street, architect.——Pittsburg, Pa.: The estate of Alexander King will erect a six-story brick business house, 42x107, on Liberty avenue; cost, $39,000. Builder, W. J. McMaster. Architect J. E. Obitz has plans for a double brick house for Charles Schwan, to be erected on Centre avenue.——Washington, D. C.: Builder Charles A. Langley has a contract to erect a three-story and basement residence, 44x72, for Dr. Frederick D. May, at 1437 Rhode Island avenue. It will be a double house, with front of pressed brick; cost, $50,000. Architect James F. Denson is now finishing plans for the law-school building for Georgetown University, on the south side of E street, between Fifth and Sixth streets, northwest. It will be a three-story and cellar structure. Architect Gray has made plans for a stone dwelling which Mr. F. W. Pilling will erect at 1536 Sixteenth street, northwest, for Mr. Randolph Kauffman. Architects Fava, Naeff & Co. are making plans for a three-story fifty-room hotel that will be built at Cornwall, Va. It will have stone base and frame superstructure; cost, $25,000. They have also the commission to make plans for the Christian church that will be built at Pulaski City, Va. It will be a two-story stone structure; cost, $25,000. —Boulder, Colo.: Plans have been prepared for the erection of a $10,000 club-house. Mr. Edwin Williams, of the Boston and Colorado Sampling Works, can be addressed for particulars.——Colorado Springs, Colo.: Mr. A. Long, will erect a new brick hotel here, to cost $75,000; six-story hotel to be erected by a syndicate, to cost $150,000. L. M. Wood, of Denver, architect.——Denver, Colo.: The University Club of Denver has been incorporated, and will build a club-house. The directors are John L. Jerome, Wm. R. Barbour, Sage Z. Dimmitt. Architect John J. Huddart has prepared plans for a school-building, to cost $80,000. New private family hotel, to cost $46,000, will be built by Architects Lee & Boel, of Denver. Mr. Milo A. Smith will build the Terrace Hotel, to cost $65,000.——Chicago, Ill.: Wm. Strippleman has prepared plans for an eight-story fire-proof hotel, to be erected at the corner of Michigan avenue and Thirty-fifth street by D. B. Purington and others; cost, $350,000. James G. Cozzens has leased the southwest corner of Michigan avenue and Thirty-fifth street, 89½x195½, and will erect a fine apartment building, to cost $200,000. John J. Kouhn is preparing plans for a four-story apartment house, 100x100, to be erected at the northwest corner of Vernon avenue and Twenty-ninth street by Charles E. Waters and Wm. J. Richardson; cost, $70,000. Kley & Lang will plan a seven-story addition to the J. S. Ford Johnson chair factory, at Halsted and Grand streets; cost, $35,000: also a two-story residence for Mr. Melinke, to be erected on Robey, near Division street; cost, $16,000; also a two-story and basement store and flat building, 44x100, to be erected at Sandwich, Ill., by Henry Heness; cost, $15,000; also a three-story and cellar flat building, 25x82, for Edwin C. Ohlendors, to be erected at 523 North Lincoln street; cost, $9,000. Flanders & Zimmerman have prepared plans for four three-story and basement public-school buildings, to be erected in various parts of the city. They will be constructed of stone and brick, and will cost about $65,000 each. George O. Garnsey has planned a two-story and cellar warehouse and a flat building for N. B. Judah, to be built at 137–141 Twenty-sixth street; cost, $35,000. Perley Hale has planned a two-story and basement flat building, 78x67, to be built in Englewood by Hanchett & Jolley; cost, $20,000; also a four-story and basement hotel building for H. A. & C A. Chapin, to be built on Sherman, near Van Buren street; cost, $10,000. C. M. Palmer has prepared plans for six three-story and basement dwellings, to be built on Division street, near Astor street, by Potter Palmer. They will be constructed of stone, with elaborately finished interiors, and will cost about $85,000. J. L. Merriam has planned a three-story and basement flat building, to be erected on Dearborn street by H. Huntington; cost, $10,000. Fred Alschlager has planned a six-story and basement store and flat building, to be built at 6222 South Halsted street; cost, $30,000: also a two-story frame residence for Fred N. Snow, to be erected at Ninety-fifth street in Longwood; cost, $6,000; also a four-story and flat building for the M. Espert estate, to be erected at the corner of Twentieth and Dearborn streets; cost, $15,000. Fromman & Jebsen have planned a two-story factory, to be built at 410–414 Hawthorn avenue by August Huer; cost, $12,000. A. G. Morey has designed two three-story stone-front dwellings, to be erected on Roslyn place, Lakeview, for himself; cost, $14,000. A. M. F. Colton has planned a dwelling for himself, to be built at 426 East

Chicago avenue; cost, $10,000. Hetherington & Warner have designed a three-story and basement flat building for Frank Leoni, to be built at 1366 West Madison street; cost, $9,000. J. B. Waller will erect an eight or ten story apartment house at the northeast corner of Dearborn avenue and Division street; cost, about $150,000. Crowen & Richards will plan a theater, to be erected on Clark street, south of Van Buren, by T. V. Day. The building will be four stories high; cost, $75,000.——New York, N. Y.: Webber & Drosser have designed for the De La Vergne Refrigerating Machine Co. a two-story brick and iron factory, to be built on the north side of East 137th street, near the river, at a cost of $70,000. Charles Buck & Co. have prepared designs for six four-story brick and limestone dwellings, which they will erect on the south side of 87th street, east of Columbus avenue, at a cost of $120,000. D. T. Atwood has designed for the Italian Hospital Society a two-story and basement hospital, to be built of brick, stone and terra cotta, on the south side of 109th street, between 1st and 2nd avenues; cost, $32,000.——Sioux City, Ia.: The Tollerton-Stetson Co., 207–9–11 Pearl street, will rebuild their warehouse, recently burned, of brick and stone; cost, $20,000.——Detroit, Mich.: Corner Crescent Park and Bostwick street, two three-story apartment houses; cost, $50,000; owner, Mrs. S. L. Boynton. Corner Lafayette avenue and Shelby streets, eight-story office building and printing-house; cost, $400,000; owners, Seripps Bros. Randolph street, three-story business building; cost, $10,000. Owner, Brush estate——Eddy, N. M.: It is proposed to erect a $30,000 court-house.——Elgin, Ill.: Architect W. W. Abell has completed plans for a large manufacturing plant; cost, about $40,000. Owners, Geo. W. Ludlow & Co., Chicago.

HEATING AND LIGHTING.

Sulphur Springs, Texas: Bids will be received for electric light till April 1.——Washington, D. C.: Bids are wanted at the Treasury Department for low-pressure, return-circulation, steam-heating and ventilating aoparatus for court-house, post-office, etc., at Augusta, Ga.——Pueblo, Colo.: A third electric light company has been formed, with a capital stock of $100,000, and at the next meeting of the city council a franchise will be applied for.——Kamloops, B. C.: A joint stock company is being incorporated to operate the electric light plant recently established.——San Jose, Cal.: The Pacific Coast Illuminating and Fuel Company has been organized; capital stock, $300,000. R. E. Pierce, president.——Cuero, Tex.: G. Jaeger, contractor, has been conferring with citizens about putting in a $15,000 electric plant.——Pittsburg, Pa.: The Board of Trustees of Pennsylvania College is about receiving estimates for an electric lighting plant to light some twenty buildings. Dr. McKnight, of Gettysburg, can give information.——Corvallis, Ore.: An appropriation has been made with which to establish a gas plant here.——Millbury, Mass.: It is propsed to establish a gas plant at this place.——Cincinnati, O.: The Cincinnati Edison Electric Company has been organized, with a capital stock of $1,000,000.——Martinsville, Ind.: A stock company has been formed to establish an electric light and power plant.

SEWERAGE NOTES.

Sulphur Springs, Tex.: Proposals are wanted for a sewerage system.——Youngstown, O.: Brick and pipe sewers will be built to the extent of 46,000 feet.——Waltham, Mass.: The sewerage committee has opened bids for the construction of the new system of sewers. All the bids for building section one were rejected, and new proposals will be called for. Clemens Bros., Cleveland, Ohio, were awarded the contract for the construction of sections two and three.——Reading, Pa.: The city engineer has been instructed to prepare estimates, etc., for numerous additional sewers.——Corvallis, Ore.: It is proposed to expend the sum of $30,000 for a system of sewers for this place.——Hartford, Conn.: Considerable sewer work is to be done at this place.——Lexington, Ky.: Considerable sewer work is to be done at this place. Address the city clerk for particulars.——Paulding, O.: It is proposed to expend the sum of $16,000 for sewerage purposes at this place.——San Antonio, Tex.: The city proposes to put in a system of sewerage.——Des Moines, Ia.: The city council has authorized the construction of numerous additional sewers. For particulars address City Engineer Laird.

WATER-WORKS NOTES.

Ballard, Wash.: For particulars regarding the construction of water-works, address City Clerk Hadfield.——Keene, N. H.: Ten miles of cement lined pipe will be taken out and cast iron laid at an estimated cost of $45,000. Address Superintendent B. F. Babbidge.——Salt Lake City, Utah: The cost of the projected water-works improvement is estimated at $180,000. Action in the matter will soon be taken. Address City Engineer Doremus.——Kansas City, Mo.: A new water-works ordinance will be introduced in the Upper House by President Cannon, providing for the issue of bonds for construction.——Prospect, N. Y.: It is reported that a system of water-works is to be established. The town clerk can give information.——Newberne, N. C: Committee on investigation has recommended the construction of water-works at an estimated cost of $60,000.——Mount Tabor, Ore.: The Mount Tabor Water Company has been incorporated with a capital stock of $5.000, to construct water-works.——Corvallis, Ore.: The sum of $50,000 has been appropriated for the construction of a system of water-works.——Woonsocket, Mass.: It is proposed to increase the local water supply by adding a new pumping engine of $5,000,000 gallons capacity daily. Mayor Pond can furnish particulars.——Stratford, Conn.: The Citizens' Water Company has been incorporated, with headquarters here. F. P. Allen can furnish particulars.——Stanford, Ky.: It is proposed to hold a public election at this place to decide the question of expending the sum of $20,000 on a system of water-works.——Rochester, N. Y.: At a meeting of the Common Council held Feb. 24th, Alderman McMillan presented a petition in favor of the passage of a resolution authorizing the mayor to appoint three competent business men and real estate owners as a committee to gather information with reference to the best method of obtaining an additional water supply for the city, and make a written report to the mayor. It was signed by over a hundred citizens and was referred to the water supply committee.——Groton, Conn.: Address E. A. Hewitt, president Board of Trade, for particulars regarding water-works.——Macomb, Ill.: There was a resolution adopted at the last council meeting to submit to the legal voters of the city at the next spring election (April 1st) the question of bonding the city for $25,000 to erect water-works.——Cincinnati, O.: The Senate has passed the bill to authorize the Board of City Affairs to issue bonds to the amount of $200,000, for the benefit of the city water-works, and the bill is now a law. The money raised by the sale of the bonds is to be used in the purchase of high pressure pumps for the Eden Park reservoir, and to extend mains to the hilltops and other outlying suburbs.——Tacoma, Wash.: It is reported that the Tacoma Light and Water Company is again contemplating an increase in its supply by running a pipe line from American lake, where it is intended to put in pumping machinery. This move, it is estimated, will cost $300,000, and is only intended as a temporary arrangement until the supply from Green river can be brought into this city. This latter work will, it has been reported, cost from $2,500,000 to $3,000,000.——Lowell, Mass.: The water board will soon want proposals for 750 tons of 30-inch cast iron pipe, to be used to duplicate part of the existing conduit line which reaches from the brick water house on Riverside street to the pumping station and reservoir.——Macon, Ga.: The contemplated improvements to be made to the local water-works are estimated to cost $200,000, and will consist in part of sinking an additional well, 200 feet in diameter and fifteen feet deep, at the pumping station, and a new 24-inch main.——Nashville, Tenn.: The improvements contemplated is the completion of intake pipe and probably the purchase of a new engine.——Troy, Ala.: Senator Parks has introduced a bill in the Senate at Montgomery, authorizing the mayor of Troy to establish a system of water-works.——Mt. Clemens, Mich.: The American Filter Company, of Chicago, will increase the filter plant to a capacity of $1,000,000 gallons per day.——Malden, Mass.: The water commissioners of Malden, Mass., have recommended the issue of $30,000 bonds for the water construction fund.——Auburn, Neb.: The city council has ordered a survey of the city and an estimate of the cost of constructing first-class water-works.——Littleton, Cal.: Preparations are being made to have a new water system. About $20,000 will be spent.——San Jose, Cal.: The Glen-Weber Water Company has asked for a franchise to supply the town with water.——Bactrop,

Tex.: The Improvement and Investment Company has resolved to expend its entire paid up stock to the construction of water-works.——Detroit, Mich.: The fire commissioners have asked the water board to lay larger mains on Miami avenue from Gratiot to Woodward avenues, and on Washington avenue from Grand river avenue to Park street. Connecting mains between these two are requested on John R. Clifford, Wilcox streets and Grand River avenue.

BIDS AND CONTRACTS.

Clarendon, Tex.: Bids will be received by R. E. Montgomery until March 21 for the erection of a new hotel. Plans and specifications on file.——Washington, D. C.: Proposals will be received at the office of the Supervising architect, Treasury Department, until 2 P. M., on the 24th day of March, 1891, for all the labor and materials and fixing in place complete, the low-pressure, steam heating and mechanical ventilating apparatus for the U. S. Post-Office, etc., building at Brooklyn, N. Y., in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Superintendent at Brooklyn, N. Y. Each bid must be accompanied by a certified check for $500. Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, until 2 o'clock P. M. on the 17th day of March, 1891, for all the labor and material, fixing in place complete, the low pressure, return-circulation, steam-heating and ventilating apparatus for the United States Court-House, Post-Office, etc., building at Augusta, Ga., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the Superintendent in Augusta, Ga. Each bid must be accompanied by a certified check for $100. Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 18th day of March, 1891, for all the labor and material required for the approaches to the United States Court-house, Post-Office and Custom-house at Vicksburg, Miss., in accordance with the drawing and specification, copies of which may be had on application at this office or the office of the Superintendent at Vicksburg, Miss. Each bid must be accompanied by a certified check for $100.——Taylor, Tex.: E. S. Mackin, architect, will receive bids until March 15, for the erection of a church, to be built of pressed brick and stone. Estimated cost, $10,000.——Sulphur Springs, Tex.: Proposals for a system of water-works, sewerage and electric lights will be received until April 1. Address W. F. Henderson, Mayor.——Cincinnati, O.: Proposals are wanted until March 26, for the improvement of numerous streets of this city. Address Thomas G. Smith, President Board of City Affairs, as above.——New York: Engineer Office, U. S. Army, Army Building, 39 Whitehall street, New York, N. Y. Sealed proposals, in triplicate, for construction of breakwater at Duck Island Harbor, Conn., will be received at this office until 12 o'clock, noon, on Monday, March 23, 1891.——Youngstown, Ohio: Proposals are wanted until March 14th, for the construction of 4,600 feet of brick and pipe sewer. Address G. D. Hersey, city engineer.——Santa Ana, Cal.: Proposals are wanted March 16, for the construction of a complete system of water-works. Address Ed. Tedford, city clerk. Sealed proposals will be received by the city clerk of the city of Santa Ana, Cal., for the construction of a complete system of water-works. The system to be a combination of the stand-pipe, with the Holly or direct pressure system, according to plans and specifications now on file in the city clerk's office in said city. Bids will be received up to 5 o'clock P. M. of March the 16th, 1891, the work to be completed within six months from date of the contract.——New York City: Proposals are wanted until March 20, for building a temporary timber dyke in the Shrewsbury River. Address Thomas. L. Casey, Captain of Engineers, U. S. A.——New York, N. Y.: U. S. Engineer office, Room E-8, Army Building, 39 Whitehall street. Sealed proposals for building temporary timber dyke in the Shrewsbury River, North Branch, N. J., will be received at this office until 12 o'clock, noon, March 20, 1891. Proposals must be made in triplicate. All necessary information may be had on application at this office. Colonel C. H. Tompkins, U. S. Army, Governor's Island, N. Y. H., has been given authority to advertise for bids for building at Fort Niagara, N. Y. Lieutenant E. L. Loveridge of the latter post is authorized to invite proposals for repairs to buildings.

HEALTH vs. FASHION.

To be fashionable, one must frequently violate the laws of health. It is both fashionable and healthful to go to Hot Springs, Ark. The Wabash road is the favorite line to that great winter resort. Compartment sleepers Chicago to St. Louis, where direct connection is made morning and evening with a double daily line of sleepers to Hot Springs. Berths reserved through from Chicago.

"LAUGH AND GROW FAT"

Is a wise old saw; yet the close confinement of winter tells even on the merriest. For an agreeable change go to Hot Springs, Ark. The Wabash is the Hot Springs Line. Compartment sleepers Chicago to St. Louis, where direct connection is made morning and evening with through sleepers to Hot Springs. Sleeping car berths through from Chicago reserved in advance.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

W. C. VOSBURGH MFG. CO. [LIMITED.]

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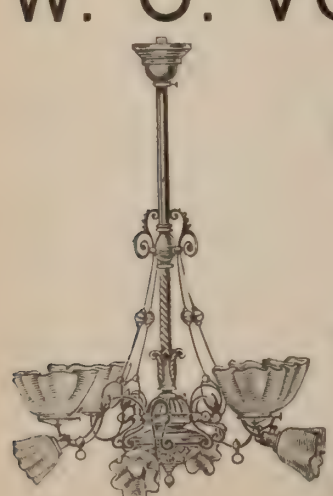

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The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to The Sanitary News.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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The House bill now before the Indiana Legislature, which is published in another part of this issue, relating to plumbing inspectors and examination and registration of plumbers, will no doubt become a law before the present session closes. There is some opposition to it in the House, but it is believed that it will be passed. The Senate will certainly pass the bill as it was approved by that body two years ago. It is difficult to imagine from what source opposition to such a bill as this springs; but then there is no telling what is in the mind of some legislators, there being room for so much.

The decorations of a home, the indulgence of fine and luxurious tastes, are all commendable and not to be denied those whose means can procure them; but before all the surplus money is expended in constructing a home filled with fine tapestries, moulding, furniture, etc., we would suggest that the plumbing receive a liberal appropriation. It is the most important feature about house construction. All else, however elaborate and exquisite, comes to naught through the disasters that follow poor and defective plumbing. Let the gates be shut against disease by the skillful hand of the experienced master.

Sanitary science has received a greater impetus and support from the plumbing fraternity than from any other one agency, and yet there those who oppose their entrance into official positions which require the service for which they are especially qualified.

When legal advice is wanted a lawyer is consulted; when medical aid is needed a physician is called; when a substance is to be analyzed a chemist's services are secured; when a house is to be painted a painter is procured; when a tooth needs repair the dentist is visited. This is all right, but why does not the same sensible rule hold good when an inspector of plumbing is wanted?

We do not know of a first-class plumber anywhere who opposes examination and registration. There may be such persons, but we will venture the statement that they are about the scarcest article this world affords. Examination and registration aid the plumber by establishing in him public confidence at once. They give him an official guarantee, which is of public record, that he is properly qualified to render the important services pertaining to his calling.

Any means that will save money or anything that has a tangible money value, will be accepted and utilized at once; but when it comes to saving life and preserving health, the public mind seems to be altogether different.

Statistics has clearly demonstrated that in cities, where regulations have enforced good plumbing, the death-rate has been materially lessened, yet there are narrow and prejudiced minds to oppose reforms in this important means of sanitation.

The sentiment in support of reform and progress in sanitary plumbing is clearly discernable in the numerous bills before the legislatures of different states. This is a healthful sign and evidences the growth of public opinion in this regard. In the contemplation of this happy state of affairs, it is but due the plumbers to give them credit for it all.

Some people seem to act on the opinion that all plumbing is bad and that the worst is the best.

The discussion of traps now going on in The Sanitary News is not in any sense a scheme for advertising any trap or in any way in interest of any one. Mr. Kelly, in his article in this issue seems to cast that reflection, but, at the same time, he expresses his preference for traps, and no one we hope will accuse him of being interested in such traps and seeking thus to advertise them. The different traps discussed are before the people. They are being largely manufactured and used, and we have permitted, or rather invited, this discussion from practical men regarding the merits of these important sanitary appliances in actual use. We favor no trap and discriminate against none. The Sanitary News is not responsible for the opinions of the writers. It will be fair toward all the interests involved and give all an equal chance, believing that liberal discussion on any subject can do no harm but a great deal of good.

NOTES AND NEWS.

The record of deaths in the streets of London the past year was 250, with 5,000 minor accidents reported.

German brewers found using "saccharine" in their beers will in future be heavily fined and imprisoned for six months.

Saturated steam at sixty pounds pressure to the square inch has a temperature of 292.52 deg. F., and one pound of the vapor occupies a volume of 7.0328 cubic feet, and one cubic foot weighs 0.142.19.

Yachtsmen who do not like the black tar in their deck-seams can now get it white, a white pitch having been invented that can be run into the seams hot, and which will then stand the sun's heat in any climate.

The overhead wires originally selected for the telephone service in London were galvanized, and weighed 224 pounds to the mile; but these are now replaced by silicon bronze, weighing 36 pounds per mile,

A new insecticide is the subject of a Florida patent. It is a compound of sulphur, caustic soda, chloride of sodium, nitrate of potassa and water, the invention including the process by which the sulphur is reduced from a solid to a fluid condition.

The lacquer used on chandelier work is made of shellac and 95 per cent. of alcohol, very thin, and slightly colored with dragon's blood to give it an orange color. The lacquer should stand for a few days for the insoluble part of the gum to settle; the clear lacquer should then be poured off and filtered.

It has been found, from an investigation made at Dundee, that when a dense fog exists, the proportion of carbonic acid gas in the air is eight volumes per 10,000—the normal proportion being four. In London the proportion is twelve volumes, or even more, under similar circumstances.

To make a dead-black polish on brass, for microscopes, etc., mix one ounce of nitrate of silver in a dish with 20 ounces of distilled water. In another dish mix one ounce of nitrate of copper with 20 ounces of distilled water. Mix the two solutions together, dip the brass in the liquid, remove the brass, and heat in an oven until the desired degree of black is obtained.

One of the vexed questions in steam engineering to-day is, of how much use is the steam-jacket? Some authorities say it is a valuable addition to a steam engine, others that it makes no appreciable difference in economy, and others still, that it is a source of positive loss.

A German engineer has devised a new method for fixing a foundation under water. By means of a powerful blast of compressed air, he drives powdered cement down into the sand or mud at the bottom of a stream, The action of the water immediately fixes the cement, and it becomes like solid rock.

Aluminum bronze of ten per cent., it is claimed, has a working strength of 310,000 pounds, as against 80,000 pounds for steel; hence, when the time comes, which cannot be far distant, for building bridges of aluminum or its alloy, we shall have a structure about one-third the present weight, and much stronger.

The Seattle (Washington) *Press* states that quite recently, near Ledro, a party of prospectors discovered "a mine of asbestos which is inexhaustible in quantity." They had brought with them a sample, and, from what was seen of it and learned from one of the miners who had considerable experience in connection with this material, "it is thought that the quality of this mineral is of a superior order."

The greatest obstacle to the correct application of sanitary principles is either the ignorance or carelessness of those likely to be benefited. Men of general intelligence will allow their farmyards, cellars, ponds, drains, etc., to be breeders of disease which may endanger not only their lives, but that of the neighborhood, simply through carelessness, or fear of temporary expense, and through ignorance often of the serious consequences involved. If the masses of the people possessed proper education in sanitary matters, the death-rate in the rural districts especially would be very much lessened.

The following mixture has been used with great success for the cementing of iron sailing tops, iron gratings to stoves, etc., with such effect as to resist the blows of a sledge-hammer: This mixture is composed of equal parts of sulphur and white lead, with about one-sixth proportion of borax, the three being thoroughly incorporated together, so as to form one homogeneous mass. When the application is to be made of this composition, it is wet with strong sulphuric acid, and a thin layer of it is placed between the two pieces of iron, these being at once pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the work having every appearance of welding.

The brass articles that are fashionable just now require careful attention to keep them clean and bright. If not lacquered, rub sweet oil on the flannel, finally polished with a chamois. If laquered, wash with a soft brush in warm water and soap, wipe well, and set before the fire until perfectly dry. Bronzes are cleaned with sweet oil rubbed on with a brush, then rub off with a second brush, and polish with a chamois. Another plan is to plunge them into boiling water until very hot, then wash with flannel and yellow soap, drying carefully with soft rags. If soap and water prove ineffectual, try beeswax dissolved in turpentine, rubbed on and off with clean, soft rags.

A silvering solution, which will cover brass, German silver and copper with a thin but substantial film of silver, may be made by adding to a strong solution of silver nitrate sufficient of a solution of potassium cyanide to re-dissolve the precipitate at first thrown down. Mix in with this sufficient Spanish whiting or precipitated chalk to make a thin paste. This solution, to obtain its best effect, should be slightly warmed before application, and the articles to be silvered should be clean and free from grease. By scattering or rubbing zinc filings over the surface to be silvered, especially if it be of copper, a much more beautiful effect is produced, the filings being washed off after the silver coating is obtained.

The *Locomotive* directs attention to a very dangerous practice in fitting steam gauges attached to house-heating boilers. It says: We often find steam gauges so arranged that their indications are necessarily a number of pounds in error, owing to the static pressure of water of condensation in the connections. While the error does not ordinarily exceed two or three pounds, it sometimes is far greater than this, and becomes of grave importance, especially in low-pressure systems. We met with a case recently in which an ordinary heating boiler was in the basement, and the gauge was in the owner's room on the third floor, fully twenty-five feet above. The piping was so arranged that it was an easy matter for it to fill up with water condensed from the steam, so that the indication of the gauge might be as much as ten pounds less than the actual pressure in the boiler. Such a gauge, it need hardly be said, is no better than none at all. In fact, it becomes a positive source of danger.

PARIS BUILDINGS FROM A SANITARY POINT OF VIEW.

As Constantinople is beautiful as seen from the sea, so Paris is beautiful as seen from her streets—the best kept in the world about her best quarters. But entering the dwellings might be compared to entering the streets of the Turkish city. It is most evident how behind the times the French are in those conditions of sanitary arrangements which are so vital to us. We find a state of things which was hardly known in London a hundred years ago. Why is this? Simply because the inhabitant here has altogether a lower standard in the idea of cleanliness than America or England has, and he is quite content, finding no particular objection to hermetically sealed windows or the poisonous gases arising from the cesspools by the soil pipe. This does not refer to the lower or middle classes alone, but throughout all society the existing standard is a low one, and it probably arises from a loose status of morality. What would be disagreeable to the decency of a Saxon is not improper to those of his corresponding station in France, who term an ordinary moral decency prudery or fastidiousness.

However, whether it is right or not to assume a connection of the two traits, modern science is now stimulating those who demand and those who command to a sense of the fearfully bad state of their physical atmospheres. Speaking lately to one of the directors of the sewerage department, placed under the control of the Prefecture de la Seine, he said that the abominable practice of fixed and portable cesspools would disappear as quickly as conditions permitted the construction of sewers, but to us this appears a very remote time. Thus it is that, for a system which is practically condemned by the municipal authorities, it is not deemed worth while to create any such laws as we have at home; indeed beyond regulations for the clearances, the size and form of the receptacles and soil pipes, there is nothing to compel a house proprietor to put his property into anything like proper condition, that is, where no direct sewers exist. Of these regulations we will speak further. When at last the condition of closets and drains become unendurable to the house occupants, they have two bodies to apply to: "The commission for the inspection of insalubrious dwellings," and the municipal police. Contrast this with our own institutions for guarding the public health or to the many vigilant bodies in England. Under these, seven-tenths of the beautiful houses in Paris would be at once condemned,

This condition is well known to doctors, scientists and engineers, and they say: "We find the filth of London in the streets, the houses pure and clean. In Paris our streets are the envy of the world, in our houses you find the filth." Because his dwelling is not his home the Parisian's indifference may to some extent be understood. But a small proportion, especially in the wealthy classes who can pay, order their things such as could be but ordinary comfort to an Anglo-American of a very much lower "pocket status".

Having little fear of mephitic gases, so also the Gaul heeds not dirt or dirty processes just so long as it is not apparent to the eye. No better illustration of this can be mentioned than where a butcher's assistant (of no very high order of sanitary scrupulousness) handles and works up a piece of meat into the most artistic and enticing form in from five to thirty minutes work, and then the wealthy recipient "rejoices, and knows not" nor cares so long as it does not show on the surface.

Charles R. King.

THE FILTRATION OF NATURAL WATERS.*

(Concluded from page 208.)

The surface waters used to supply London from the Thames or the Lee are filtered by the method of continuous filtration, a surface of 100 acres being required for the purpose. The thickness of sand differs with the different companies supplying the city with water, from two feet at the East London and Grand Junction companies to 4½ feet at the Chelsea Company, and the rate of filtration per hour in imperial gallons per square foot of filtering surface is two and one-sixth with the Lambeth Company to 1½ gallons with the Southwark & Vauxhall Company. Two and one-half gallons, or five vertical inches an hour (which is seldom attained), is considered the maximum consistent with good clarification. Complete analyses are made of the water supplied to the metropolis by the different companies. Some of the determinations, as for instance color, and the amount of permanganate to oxidize the organic matter, are made daily; other chemical determinations are made weekly. The monthly determinations made by Dr. Percy F. Frankland, of the bacteria in the waters of the different companies have been suspended since December, 1888. The average reduction of the number of micro-organisms present in the waters of the Thames and Lee was, in 1887, 97.6 per cent. in the case of the Thames, and 93.9 in the case of the Lee. "If," says the report on the metropolitan supply for December, 1888, "these figures could be accepted as at all representing the degree of security given to consumers of the waters of those rivers by preliminary filtration, it is evident that the views on this subject acquired by a consideration merely of the results of comparative chemical analysis of filtered and unfiltered waters would have to be considerably modified, and the character of the water supply would be correspondingly raised in public estimation. Further, if the results obtained from month to month could be relied on as an index to the effect of filtration in eliminating objectionable matters from the water, the bacteriological method would seem to afford a delicate and easily-applied test of the working efficiency of the filter."

The average number of bacteria in the water of the Thames is generally less than in the Spree at Berlin. Thus, during the year ending December, 1887, the highest number in November was 81,000, and the lowest in June was 2,200—the average for the year being 21,492.

The only filtering plant in this country, that I know of, which at all compares with the plants in Europe, is that at Poughkeepsie, where the Hudson river water is converted into good, clear water, though not absolutely free from color. Mr. Fowler, the superintendent of the works, writes me with regard to the details of the filtration: "Our usual rate of filtration is about six inches per hour, vertically, and this we regard as the maximum of efficiency, although we can sometimes do good work, so far as clarifying is concerned, at double that rate, and at other times are unable to do good work at one-half that rate, although the latter condition is exceptional. Very much depends upon the condition of the water in the river. The depth of water on the sand varies from one to three or four feet, and the difference of level between the surface of the water on the beds and that in the intermediate basins is usually two to four or five feet."

The rapid filtration of water through coarse gravel is not unfrequently carried out at water-works to remove the larger particles floating in the water. When a filter of this kind is cleaned, it is surprising to see the amount of fine dirt of all kinds that has been intercepted by the coarse material. Filters of this character do not pretend to purify the water in the sense of removing bacteria, or in oxidizing the organic matter, but they are useful just to the extent to which they clarify the water, and thereby improve its appearance.

The American system of filtering large quantities of water may be said to be the mechanical filters working under pressure. These filters are composed of four or five feet of moderately fine sand (some have also a mixture of coke), enclosed generally in boiler-iron cases. They work with tremendous rapidity, sometimes over a hundred vertical feet an hour; but forty feet is said by some to be the highest rate consistent with good filtration. In this system alum is generally added to the water as a coagulent. Its effect in very small amount is quite remarkable—say a grain to a gallon, or even less—in retaining the solid matters of the water in the sand of the filter. The alum is decomposed by the carbonates in the water, and hydrate of alumina is precipitated. This is a gelatinous and slimy substance, and immediately surrounds the algæ, clay, and anything else that may be suspended in the water, and the sand retains this coagulated mass. Alumina has also the effect of taking the color out of water, so that clear, colorless water may be obtained by this process from swampy waters full of growing algæ, with almost incredible rapidity.

These filters are in very general use in paper-mills and other industrial works where a clear, colorless water is needed, and where a colored, turbid river-water is the only natural supply available. They have also been introduced into some cities of considerable size, as, for instance, Long Branch, Chattanooga and Atlanta, and they are said to give water that is satisfactory to those who use it. The objection to the system is the use of alum. If all the alum used were decomposed in the few seconds that it takes the water to pass through the filter, so that no undecomposed alum passed into the filtered water, there might be no objection to its use; but this is not always the case. The amount of alum used is ordinarily small, and it is claimed that even if it all went into the filtered water, it would not injure it for drinking. This may be so, but the prejudice that exists against drinking-water that has been treated with "chemicals" is so strong that it is not likely that any system using a coagulent in a soluble form will find generable acceptance. Under some conditions, when the water has high color with much suspended matter, the alum has to be increased largely to give good results. I have known as high as seventeen grains to the gallon to be used with a very bad swampy water.

In this connection should be mentioned the spongy iron filter of Bischof, which gives most excellent results, both in taking out suspended matters from the water, including the bacteria, and also decreasing the hardness of the water. This filter has been used on the small scale in houses, and also on the large scale in Antwerp, to decolorize and otherwise purify the water of that city. The filter is composed of finely-divided metallic iron, made by reducing iron ore by means of carbon at a temperature below fusion. Its action was not understood for a long time, and the mystery that surrounded it was an additional recommendation for it. The rationale of its working seems to be this, namely: that the iron, being in a very finely-divided state, is dissolved to a slight extent by the combined action of the oxygen and carbonic acid in the water, and the ferrous carbonate thus produced is further oxidized, forming hydrate of iron, and then this acts as a coagulent just as the alumina hydrate does. The system was said to be too expensive on a large scale, and it has now been replaced at Antwerp by the Anderson process, in which the dark water is made to pass through a long revolving iron cylinder in which there is a large quantity of fragments of cast iron. These fragments of iron, in their friction one on the other, are abraded; minute particles are broken off, which are dissolved in the way above described. The water coming from the revolving cylinder is exposed to the air; the iron oxidizes and precipitates, combines with the coloring matter in the water, encloses the solid particles, and is then fil-

*By Thomas M. Drown, Member Boston Society Civil Engineers, from the Journal of the Association of Engineering Societies.

tered out through sand. The process is said to work satisfactorily and give clear, colorless water. There is no objection to this use of iron as a coagulent, provided that it is all oxidized and precipitated, and none is carried in solution into the filtered water; but this takes time.

Both alum and iron salts have a tendency to sterilize water. Their action may be both direct by killing the bacteria, and indirect by removing them with the precipitated alumina or iron hydrate. If a drop of a solution of alum or of iron chloride be added to a gallon of turbid water, it will become perfectly clear in the course of a few hours, the alumina or iron hydrate, which is formed in the water, settling to the bottom and carrying all the suspended matter with them. It has been proposed to clarify Mississippi water by adding a very small quantity of an iron solution to the water in the settling-basins.

I have laid some weight on the desirability of following nature's processes in the purification of impure waters. Neither the American system, with its mighty rush of waters, or the European system, with its calm, steady and deliberate flow, finds any analogy in nature. In the rapid-working mechanical filters a coagulent is used to grasp and hold the suspended matter; in the continuously-working filter-beds the bacteria are put to a novel use, in retaining the solid matter on the sticky surface of the sand.

Nature uses these methods also. She removes color by means of clay in the soil, and intercepts mechanically in the bacteria-laden soil all the solid matter in the water; but she goes further than this, and, giving the bacteria full play, breaks up the organic compounds, and leaves no trace of their existence behind. To do this, time is needed. "The bacteria of nitrification," as Dr. Smart has well said, in referring to the systems of rapid filtrations, "cannot be harnessed to the work of artificial filtration."

The rate at which nature works may be expressed in the amount of rain-fall. If we take the rain-fall at fifty inches and assume that even half of this sinks into the ground (a very high estimate), we have twenty-five inches yearly on a square foot of surface. The amount of water which goes through the Berlin filters, at a rate of four inches an hour, is more than 1,250 times this amount. If we wish to imitate the process by which nature makes its springs, we must pour the water from river or lake which we wish to filter intermittingly on the surface of ground which is favorable for this purpose. The favorable conditions are these: The ground must be sufficiently porous to allow the ready flow of water through it, and it must have such relations to the strata below as will enable us to collect the water at some lower level. It would not profit us much to pour the water on a gravel bed if we could not find it again after it had been filtered. If the natural conditions for this purpose are not favorable, drains would have to be put in at suitable depths to collect the filtered water. Water purified in this way would in nowise differ from natural spring-water, provided that the amount of water applied did not exceed the capacity of the filtering area.

The question of the maintenance of the purity of the water-supplies of large cities, which are dependent upon surface waters, is daily becoming more urgent in this country as the population becomes more dense on the collecting areas, and the protection of streams against pollution becomes more and more difficult. The radical remedy in such cases is to take water from another and, usually, more distant region, which, it is probable, will never become thickly settled. But in filtration, both intermittent and continuous, when intelligently conducted, we have a substitute which can give as clear, colorless, and, we have good reason also to suppose, safe drinking-water.

SEWERAGE AND WATER SUPPLY.

A number of towns, it is gratifying to observe, are making or are about to make provisions for a public water supply, observes the *Canada Health Journal*. Many of them, however, have no special sewerage system, and are not even providing for this. Such a course is a mistake. Certain portions of cities in like manner are sometimes supplied freely with water from the public source, where there are no sewers in the locality for carrying away the excess of water. There should invariably be some provision for carrying off the waste water from all buildings, even with the use of dry earth closets. Otherwise the soil will become most injuriously saturated with impurities. This is a rule laid down by the most experienced sanitarians, and the practice of it is of obvious utility and indispensableness.

Many small towns are prevented from introducing sewers and enjoying the more approved sanitary conditions thereby secured, by a false impression of the expense involved. The old-time sewerage system which provided for storm water as well as sewage proper, required very large costly sewer pipe. An objection to this system is the washing into the pipes of considerable quantity of sand and gravel, which formed dams at frequent intervals, causing the sewage to accumulate in pools, and filling the pipes with offensive gases which sooner or later found their way into the homes connected with the sewage system. The modern "separate system" of sewerage provides two separate pipes, one for carrying away the storm water, the other for the sewage, and is much less expensive, as sewers must be made absolutely impervious, while for storm water ordinary drains will answer. In some towns, indeed, on a high or rolling situation, the storm water may be carried off by surface drainage. It is found that small pipes answer the purpose of sewerage conduction much better than large pipes, as the stream more nearly fills the pipe, flows more freely, and thus keeps the pipes freer from sediment. An eight-inch sewer laid at a grade of even one foot in one hundred will, it is said, carry away much more sewage than will be discharged from a row of houses, each with forty feet "front," two miles long, each house occupied by five persons; it being supposed that each person will furnish not less than 60 to 80 gallons per day of sewage or contaminated water. It has been estimated that in average soils an eight-inch sewer pipe can be laid at an expense, including cost of pipe, of less than two thousand dollars per mile; the expense to each forty feet of front being only about $10.60, and the interest at 4 per cent., forty-two cents a year, or eight cents per head of occupants. With a sinking fund to pay off the principal in 20 or 40 years, so that the next generation, who would receive equal benefit, would aid in the payment, the yearly cost would be far less than is constantly being paid almost daily for some trifling, useless or injurious luxury.

HEALTH IN MICHIGAN, FEBRUARY, 1891.

For the month of February, 1891, compared with the preceding months, the reports indicate that dysentery, cerebro-spinal meningitis, cholera infantum, inflammation of brain, measles, inflammation of bowels and diphtheria increased, and that whooping-cough decreased in prevalence.

Compared with the preceding month, the temperature was slightly higher, the absolute humidity was more, the relative humidity was less, the day and the night ozone were more.

Compared with the average for the month of February in the five years, 1886–1890, membranous croup, cholera infantum, cholera morbus, influenza and erysipelas were more prevalent, and small-pox, whooping-cough, typho-malarial fever and measles were less prevalent in February, 1891.

For the month of February, 1891, compared with the average of corresponding months in the five years, 1886–1890, the temperature was higher, the absolute humidity was more, the relative humidity was less, the day and night ozone were more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of February, 1891, at sixty-eight places, scarlet fever at ninety-three places, typhoid fever at thirty-two places, and measles at fifty-nine places.

Reports from all sources show diphtheria reported at ten places less, scarlet fever at eight places less, typhoid fever at nine places less, and measles at eleven places less in the month of February, 1891, than in the preceding month.

Henry B. Baker, Secretary.

Lansing, Mich., March 6, 1891.

PLUMBING LAW FOR INDIANA.

The following engrossed House Bill for an act to secure the registration of plumbers and the supervision and inspection of plumbing and drainage in all cities of twenty thousand or more inhabitants, for the appointment therein of an inspector of plumbing, providing for the enforcement, and, prescribing a penalty for violation of the same, is now before the Indiana Legislature:

Section 1. Be it enacted by the General Assembly of the State of Indiana, that on and after the first day of May, eighteen

hundred and ninety-one, every plumber carrying on his trade in every city of twenty thousand or more inhabitants shall, under such rules and regulations as the Board of Health or Health Department of said cities shall prescribe, register his name and address with the clerk of the Board of Health or Health Department of said cities, and after said date it shall not be lawful for any person to carry on the plumbing trade in said cities unless he shall have passed a thorough apprenticeship at such trade and have passed an examination by a board of examiners, who shall be practical and skilled plumbers selected by the Board of Health or Health Department of said cities. Said Board of Health or Health Department shall issue to any plumber who shall have passed such examination satisfactorily, a certificate in writing authorizing him to engage in the business of plumbing in said cities.

Sec. 2. A list of the registered plumbers in said cities shall be published in the newspapers designated by the Common Council of said cities, or by the Common Council and Board of Aldermen in said cities having the same, to publish the official proceedings of the Boards and Departments of said cities at least once a year.

Sec. 3. The drainage and plumbing of all buildings, both public and private, erected in said cities after the first day of May, eighteen hundred and ninety-one, and of all buildings erected prior thereto where plumbing is to be introduced, or wherein changes in or additions to the plumbing and drainage are to be made, shall be executed in accordance with plans previously approved in writing by the Board of Health or Health Department of said cities; suitable drawings and descriptions of said plumbing and drainage shall, in each case, be submitted to the Board of Health or Health Department of said cities, and shall by said Board or Department be placed on file in their office.

Sec. 4. The Superior or Circuit Court of all counties wherein said cities are located, or any Judge thereof, shall have power at any time after the service of notice of violation of any of the provisions of this act, and upon the affidavit of one of the members of the Board of Health or Health Department, or Inspector of Plumbing and Drainage of said cities to restrain, by injunction, the further progress of any violation of any of the provisions of this act, or any work upon or about the building or premises upon which or with reference to which said violation exists. Any civil action which may be brought under the provisions of this act shall be brought in the name of the city whereat such action is brought, as plaintiff, and it shall be the duty of the City Attorney of said city to prosecute any such civil action, upon being directed so to do by resolution of the Board of Health or Health Department of said city.

Sec. 5. There shall be appointed by the Common Council of said cities, or by the Common Council and Board of Aldermen in said cities having the same, an Inspector of Plumbing and Drainage, whose duty it shall be to supervise, inspect and pass upon the plumbing and drainage done in any building erected in said cities, as hereinbefore provided. Such Inspector shall be a skilled and practical plumber. His term of service shall be the same length of time as that of the members of the Board of Health or Health Department of said cities. He shall receive such compensation for his services as shall be fixed by the Common Council of said cities, or by the Common Council and Board of Aldermen in said cities having the same, which shall be paid by the city for which he is appointed, and as other officers thereof are paid.

Sec. 6. The Board of Health or Health Department of said cities shall execute and enforce regulations governing plumbing, house drainage and ventilation of house sewers, as provided herein and as shall be provided by the Common Council of said cities, or by the Common Council and Board of Aldermen in said cities having the same, by ordinance; and any person who shall neglect or refuse to comply with the requirements of said regulations, when promulgated, shall be deemed guilty of a misdemeanor, punishable by a fine not to exceed one hundred dollars for each and every offense, or in default of payment of such fine, by imprisonment.

FOR UNIFORM PRACTICE.

Through the kindness of Mr. Edward L. Cook, we are enabled to publish the following code, which explains itself. It is practically the code recommended by the National Association of Builders, with some alterations made necessary to adapt it to local conditions. The leading architects of Buffalo are desirous of establishing some uniform system, and favor this code at present, or until the practical application of it may suggest an improvement:

At a special meeting of the Master Plumbers' Association, held February 25, 1891, the following code was adopted unanimously:

Whereas, The manner of receiving bids and of treating bidders on work in architect's office has varied, and to make a uniform and fair method of practice, now, therefore, on and after the first day of March, 1891, we, the members of the Master Plumbers' Association, absolutely refuse to submit bids for work unless the following code is used and adopted:

Between Architects and Builders—Code.—Just and proper methods which should prevail when estimates are solicited from contractors in the building trades.

Plans.—Drawings, when offered by architects for final and competitive estimates, must be sufficient in number and character to represent the proposed works clearly, and shall be at a scale of not less than one-eighth of an inch to the foot, and be rendered in ink or some permanent process, and colored, figured and otherwise marked, in such manner as to clearly show all kinds of material to be used, thickness of walls, etc., in the construction.

Details.—Proper details must be furnished for work that is not otherwise sufficiently described.

Specifications.—Specifications must be in ink.

They shall be definite, where not sufficiently defined and explained by drawings, and every distinctive class of work to be included in contract must be mentioned and placed under its appropriate heading.

Restrictions to Sub-Contractors.—Contractors must be notified, at time of estimate, if they are to be restricted in the employment of their sub-contractors.

Sub-Estimates in Architect's Office.—Sub-estimates for portions of the work which principal bidders are required to include in their original estimates should not be received in architect's office, either as an accommodation to principal bidders or for any other purpose.

Percentage on Sub-Contracts.—Contractors shall be allowed a compensation of five per cent. on all sub-contracts, which at the time of estimating are "reserved" or not called for in their portion of the specification, but which may be assumed by them by direction of the owner or architect, after the bids have been received and opened by them.

Contractors shall not be denied contracts upon portions of work covered in their original estimates, on account of declining to assume at any price the aforesaid reserved sub-estimates in their contract.

Sub-Contracts.—A sub-contractor shall not (without his free consent) be "placed" under a general contractor.

Award.—When work is to be let for which estimates have been solicited, unless previous notification to the contrary has been given, the lowest invited bidder shall be entitled to the contract, and all minor changes shall be agreed upon with him, provided his prices are equitable.

If radical changes are made, then the whole competition may be reopened.

Bidders must not be allowed to amend their estimates after the bids have been opened, and before the award.

If an invited contractor cannot find time to submit proposal, he must notify the architect or owner to that effect.

The plans shall be returned promptly at the time agreed upon. Bidders should be allowed reasonable time to make their estimates.

No payments on contracts shall be less than 90 per cent. of the work done; the balance of 10 per cent. to be paid within thirty days after the completion of the contract.

Notice for Opening of Bids.—Before opening the bids, the bidders shall be notified of the time when, and the place where, the bids will be opened, in the presence of the attending bidders, and awarded to the lowest invited bidder.

The uniform contract adopted by the American Institute of Architects, the Western Association of Architects, and the National Association of Builders, shall be used.

Compensation for Estimating.—Should all solicited bids

be refused, the lowest bidder shall be entitled to compensation as follows:

For estimates of $5,000 and under.....$25.00
For estimates of $5,000 to $50,000..... 50.00
For estimates of over $50,000.....100.00

Estimates shall not be binding more than thirty days after submitted, unless otherwise agreed.

Charles Geiger, President.
Robert T. Eddy, Secretary.

WHAT SHALL WE DO TO IMPROVE OUR BUSINESS?*

The writer, in handling this subject, has decided to look at it mainly from a financial standpoint, for the reason that there have been many able efforts on the sanitary features of the case, and because the great majority of our craft need more help in this direction. The subject is forced on all branches, professional as well as commercial, by the active and healthy competition, which too often falls to the level of cut-throat policy of "get all or ruin all," and which sometimes perverts an otherwise worthy ambition to succeed into the destructive sky-rocket methods, whereby many very ordinary fellows, imagining themselves the "Old Hutch" of the plumbing market, find themselves in a brief period several hundred per cent worse off than nothing, besides wasting the flower of their lives.

In order to get at the full import of this subject it is necessary to consider why our business is so generally a financial failure. The writer, in the past sixteen years as journeyman and master plumber, has seen many plumbers come and go, and in his opinion the principal causes of failure are, briefly, trying to do business on wind only, carrying heavy stocks of gas fixtures without considering or knowing anything about gas fixtures or the demand for them; rushing headlong into the heating business with the vast experience of reading some catalogue or the two hours talk with of some glib-tongued boiler agent, after which they usually try to heat buildings with figures, which, although they are said never to lie, and answer very well in the summer season, yet prove a chilly substitute for radiating surface; intemperance, which of course will ruin any business and which has sent some of the brightest lights in our craft to their graves; but the greatest causes of failure, and those which underlie nearly all other causes, are neglect of bookkeeping, carelessness in collections and credits, lack of knowledge of the actual cost of business, and trying to do two or three thousand per cent. more business than the actual capital invested.

For the past ten years we have had a profound revolution in plumbing material and methods. Many plumbers fondly hoped, and some still believe, that the mere specifying and pushing of the most costly specimens of the potters' and brass moulders' art, such as gorgeously decorated wash basins with wall paper designs of beautiful flowers, mountains, daisies, etc.; water closets with high sounding titles, named after Grecian goddesses, or French heroes, who would turn over in their graves if they knew the base use made of their names; silver plated waste pipes and sink pieces which took a month to make and puzzled the very water itself for an outlet, would be a financial salvation, and so they were (for the manufacturers), for they had sense enough to know the cost of their goods, and to see that they made a good fat profit on the same, and to give the smallest discounts and short time drafts when bills were due. Other plumbers imagined that the strictest ordinances (a few of which would make the framers of the Rhode Island blue laws weep with envy), would be a big bonanza. And besides they hope to make plumbing so difficult that that other fellow around the corner couldn't do that kind of a job. But the other fellow still lived, and some of the self same ordinances, designed to protect the good, conscientious plumber, have here and there acted as a screen for the quack plumber and fat for the ward bummers and grog-shop politicians.

None of these assertions are intended to cast ridicule on fine plumbing material and equitable plumbing laws; for the writer endeavors by precept and example to advocate both daily. But neither will make a dollar a year for the plumber unless the business is thoroughly understood and properly conducted. A stranger becoming acquainted with our local plumbing firms could not but wonder what they had done with the millions of dollars worth of plumbing and heating that has passed through their hands in the past few years. There is hardly an intemperate man in our local association, and the majority are hard working, energetic men, and the most of them understand their business. The writer cannot recall a more able or straightforward class of men than we have here. But, like all over the country, the great majority live very closely, own no home, and possibly some have large blue bottle flies on their credit, and a highly unsanitary bank account. It is the same old story over again. Some, loaded up to the water's edge with gas fixtures, thereby dazzling their eyes in the vain expectation that the fixtures would pay the rent. But the gas fixture trust man has left his card and gone, and after him has come the busy fly and left his card and made his escape, and the styles changed also.

There are plumbers here and elsewhere who don't seem to think it is necessary to consider the cost of their work, but desire to make each job an advertisement for their own glory. They fear to make enemies, lose custom, or else they want to be popular with the masses and have lots of men employed. So, if some tin horn contractor or some jerry builder of an alleged owner with a mortgage like a jack screw, sufficient to raise both house and lot, comes along with a role of blue prints which he owes the architect for, straightway he is hailed with delight. People you would not trust with a dollar in cash are trusted with thousands of dollars in work. Some unfortunate but ambitious plumber gets the contract, and if, by any accident, he receives his pay in full, he finds the same money drawn out he put into the work, less his running expenses. These are the facts in the case. Now for the remedy:

Pay your honest debts. If you can't pay all at once, pay all you can and as fast as you can. Do no work unless you are sure, first that there is enough profit at least in the work so that the same money would make you at least as much as it would in a savings bank over and above running expenses. Get at the cost of your stuff and pay your bills every thirty days, and take no work that you cannot handle in that way. Sell no contractor nor owner nor anybody anything from a pound of solder to a bath tub without taking into consideration, that you are allowing them the use of your good hard earned money and time, as well as your reputation for business honor and integrity. If your capital is $500.00 you are a consummate ass to expect to handle a $3,000 job and live while you are doing it. For heaven's sake be something besides a hoodoo to the business and the material men. Don't be a dog in the manger, making nothing and hindering others. Any jobber will tell you that it is the history of their books, that the plumbers who paid their bills promptly every thirty days have all made money. The plumber who pays his bills and knows the actual cost of production will make an occasional low bid, but will soon tire of it as a steady diet. Don't go howling around like a howling Dervish, complaining about the way other plumbers do work. Do your own work right, it will keep you busy. Remember every time you give your brother plumber a back handed slap it will act as a boomerang and fall on yourself, and by January first every plumber here will have more money or else he will go at something else and make money. For these principles are such that, barring ill health, you have a sure thing on a living and something for old age. The writer wishes to return thanks for the kind attention given him and to disclaim all intention of personality. This essay is written not for Kansas City alone, but for the whole craft, and if the writer's efforts benefit, in the least, any member of his craft, he will consider himself richly rewarded.

*Essay read before the Kansas City Master Plumbers' Association by Dent Yates.

WATER POLLUTION AND DISEASES.

The city of Lawrence, says *The Engineering Record*, containing about 45,000 inhabitants, is situated on the Merrimac river, in the north-eastern part of Massachusetts. For the last five years it has had a relatively heavy death rate from typhoid fever, and a recent outbreak of this disease has called attention to the water supply as a probable cause of the trouble. Mr. Hiram F. Mills, chairman of the committee of the State Board of Health, in a letter to the city authorities of Lawrence, stated that the two cities, Lowell and Lawrence, both well situated, well regulated, and comparing favorably for general healthfulness with other cities in the state, have 50 per cent: more deaths by typhoid fever, for the

same population, than any other cities in the state, and that these are the only two cities in the state which draw their water for drinking from a river into which, within 20 miles above, sewage is publicly discharged. More than one-half of the cities of the state had public water supplies introduced within the years from 1869 to 1877.

In a table then submitted was given the number of deaths from typhoid fever yearly in cities of 10,000 inhabitants, in each of the cities introducing water in the above period, for the 10 years previous to the period, and for the 12 years following it. This table showed that in 16 cities of Massachusetts only one (Holyoke) had more typhoid fever than Lawrence. Lowell came next to Lawrence, ranking third.

Of these 16 cities, all but three had less typhoid fever after introducing public water supplies than before, and their average number of deaths from this cause was less than one-half of the number of deaths when they used water from wells. The three exceptional cities are Holyoke, Lawrence and Lowell, whose death rate from typhoid fever in the above period since the introduction of water has not been less than previously.

The continued high death rate from this disease of Lawrence and Lowell, which, as before stated, has in the four years previous to the last, put them, Mr. Mills continues, far beyond all of the other cities of the state, must in large measure, in the light of the experience of other cities, be attributed to the polluted water supply, and the experience of the others gives promise that, with a pure water supply, the death rate by this disease may be reduced by one-half.

This is certainly a strong indictment of the water supply of the city, but it is borne out by the analysis of the Merrimac water taken at Lawrence, as published by the State Board of Health, and there is no doubt that either the present supply should be purified or a better source of supply be secured.

The troubles of Lawrence and Lowell, due to taking water for drinking from a sewage-polluted river, are much the same as those which have afflicted Newark and Jersey City, and which will surely afflict many other cities having a like source of supply. The loss of time and labor, and the expense to citizens caused in this way are not to be measured by the increased number of deaths due to typhoid fever alone, for the use of such water causes a vast amount of diarrhœal diseases and other affections of the digestive organs which are not fatal. Whether Lawrence is in good sanitary condition, apart from its water supply, may be doubted in view of the results of a sanitary survey of the city, contained in the last annual report of the State Board of Health; but so far as the excessive prevalence of typhoid and diarrhœal diseases are concerned, the water supply must be an important, and probably the chief cause. Theoretically it is possible to filter, and otherwise treat the water of a sewage-polluted stream in such a way as render it comparatively harmless, but this is a costly matter. Theoretically, also, it should be possible by due process of law to prevent the discharge of sewage into a stream within 20 miles of a large city which takes its water supply therefrom, for the case is covered by the common law of nuisance even where there is no specific statute. Practically, however, a species of servitude on rivers for conveying wastes, etc., becomes established, and the difficulty of proving, to the satisfaction of a court, that a given water supply is dangerous to health and life is so great that the chances of obtaining relief in this way are small.

This matter of prevention should be looked to in time, and every village, town or city which obtains its water supply from a running stream, should be on the lookout to prevent that stream from being fouled by discharges of wastes and sewage into it by other towns higher up. It must be remembered, however, that the city which thus seeks to secure the purity of the water coming to it, is also under obligations not to discharge its own sewage into the stream if there are users below who may suffer from this pollution.

The complications and difficulties connected with the taking of water supply from streams along which are located a number of towns and villages are very great, so great that the engineer should always carefully consider the possibilities of other sources of supply less liable to pollution before he recommends taking it from such streams.

PLUMBING MATERIAL.

Chicago, March 9, 1891.—Editor The Sanitary News: In your number of February 28th, your correspondent, signing himself "F.," makes a good, round pleading for better work and better material. This desired result is being brought about, first, by the master plumbers in upholding the integrity of their order, and nominating good officers, endorsing trade-schools; second, by the forced application of the water-test; third, by scientific and thoughtful men bringing out appliances whose use insures better results each year; and, fourth,—which had perhaps better have been first,—that owners and architects find it no longer well at all times to give a contract to the lowest bidder, but more generally are considering the amount of care each competitor is liable to use in filling his contract.

In a matter so important and of such general interest, all should unite with the master plumbers in their efforts to keep their profession governed by good examining officers.

Mr. J. J. Blackwood, in your issue for March 7th, has another bitter complaint against his city. The cure is perhaps simple, which is to unite with the best element of the trade in making good appointments for election of plumbers and a first-class inspector, and, after getting a good one, to keep him.

From experience, I can only agree with him on his drawing of trap so far as to endorse his use of a large trap; but, going further, I should demand said trap to be of individual strength, or non-syphoning, and to be supplied with a bowl with an outlet equivalent to the diameter of his trap, thus insuring the flushing of waste-pipe. Should the ordinary bowl with small outlet be used, this small stream flowing into larger trap would deaden the flow materially.

Again, a large S-trap discharging through the waste, carrying a full plug of water, is more than ever subject to syphonage, and the slightest contraction of such pipe would make the syphonage sure; therefore, let him heed "A. J. T.'s" advice, and make himself safe with the cleanest combination trap he can get, and connect same with a large outlet-bowl. By a large outlet I mean 1½ or two inches in diameter of speed of basin-fitting. This will flush the 1¼ pipe full bore, solid; will deliver it freely, and be safe from syphonage. The S-trap will not be.

With "A. J. T." we must all thoroughly agree, as almost every plumber of note, together with owners and architects, have had this very experience, proving the need of stronger traps than the S-trap. I should, generally speaking, not endorse traps as merely a form of the pot trap, so liable to foul on the upper and lower surface; and where the trap has no ball or moving mechanism. There are traps which meet this feature, as the discharge is quick and washes the whole interior, being at their best on large, free outlets. Now that the manufacturers have proved the combination traps of best make safe and practical in varied use, it rests with the plumbers and city inspectors to further test them and allow their use, thus rendering buildings of all classes freer from the danger of so many joints as are now necessary, and allowing of surer tests and less trouble in general from repairs, etc.

Trusting more will be heard from, all around,

Very truly, J. A. Cunningham, Jr.

TRAP AND WASTE PIPE.

St. Cloud, Minn., March 9, 1891.—Editor The Sanitary News: In your issue of last week John J. Blackwood says he "would at all times have the trap larger than the waste pipe."

A small amount of common sense applied to the consideration of traps ought to teach any intelligent plumber what will happen to such a trap. Any trap retards the velocity of the water through it. Make it larger than the waste pipes above and below it and this slack water tendency is greatly increased, and grease and filth will be deposited upon the wall of the trap to the extent of filling it until the passage way for water is even smaller than the waste pipe; and in case the fixture is a kitchen sink it will sometimes become closed altogether. To make the trap smaller than the waste pipes, thus increasing the scouring force of the water through it, is better practice, though in my work I have both trap and waste the same size.

"A. J. T." should give us the benefit of his full name. His "practical experiences" are valuable because in the line of demonstrated fact, rather than "my opinion." John F. Jerrard.

TRAPS AND PLUMBING MATERIAL.

Cleveland, O., March 9, 1891.—Editor The Sanitary News: In answer to assertions made by different men on traping and ventilation, I wish to give my opinion and at the same time I will ask them a few questions:

1st. I will ask Col. Waring where and under what condition could a trap be placed so that it would by no means be subject to a siphonage when not vented?

2d. Where do the gasses go that are in the sewer and plumbing system of a house where there are no vent pipes, and there is a back pressure caused by the backing up of water in the sewers, or a volume of water coming down a stack of pipe from the upper floors of a building?

3d. I will ask "A. J. T." what he calls the best method of back-venting, and what material he used in that job he speaks of, and where it is located?

4th. Is it proper to connect the vent at the crown of the trap; if so, why?

5th. Will the water have any effect on the air in the vent pipe when passing, as illustrated in the cut of January 24th?

6th. Please sign your full name and address, so that I may know whether you are a practical man or not. Your argument does not sound like one. You say that the theory of back-venting includes that of ventilation, and that a current of air is supposed to be moving up the pipe continually, which is entirely wrong and is not supposed by any thorough practical man. The air in the vent-pipe is dead, and unless relieved by a foot-vent or by conductor openings has no current or circulation, and when relieved in this way the current of air does not need be reversed even when upward to supply air to the trap, and when not relieved it is like the air in a bottle, removed only when replaced by something else, and, when relieved by foot-vents and conductors, it depends on the temperature of the air whether the current is upward or downward. In regard to Mr. J. A. Cunningham, Jr., he is like myself. I always did all in my power for the benefit of my employer. There is nothing in his letter, only an advertisement for the Sanitas and Puro traps. I have nothing against those traps; only I claim of all the combination traps, that they are the filthiest, and there is not a combination trap that is not filthy; and the cleanest traps made that I have seen are the Montgomery Octican or the common S trap ventilated with proper size pipes, and as marked in cut of January 24th.

The only thing wrong with these traps is the vent. The manufacturers of these traps cling to the idea of venting from the crowns. There are other traps I suppose in different parts of the country that I have not seen which may be as good, but I have not seen them, therefore cannot recommend them. But if you are going to use combination traps, I would recommend the Bower trap ahead of any trap in this country. It is protected against back-pressure, and I believe it is the hardest to have its seal broken. But, as I said before, I do not believe in any combination trap. They are all filthy, and the system of ventilation is condemned only by men who are interested in these traps, and men who do not know any better. Where back-venting has failed to work it is only where it has been improperly done.

Mr. "F." of February 28th asks, "Why is it that so much inferior goods are used in plumbing?" Well, this is one of the causes: There are so many inventors who claim that they have just the thing, and the only thing that ought to be used, and to hear them explain one would think that they were right, but they tell only of its good qualities and say nothing of its bad. There is not a trap or fixture in my shop that I cannot sell by just doing the same. The people are not educated to know, therefore, they have to depend on the recommendations of the plumber or the architect. The plumbers and architects who know better and who want to do better cannot because they have to compete with men who do not know, and do not care, how a job is done so they make money; and the only thing that I can see in these complicated arrangements is that there is something in them that their inventor can use as an argument to convince people whereby he and the man selling them can make money. We have in our city rules and regulations governing plumbing, and we have inspectors to enforce them, and the question is very often asked, why are they not enforced? Well, I will give you my opinion. The head inspector is a thorough practical man and competent to discharge the duties of his office if he had the power; but he comes under the head of the Health Department, in whose power the enforcement of the rules and regulations governing plumbing is placed, and who has allowed them to be violated so often that the inspector does not know when to enforce them or when not to without making fish of one and flesh of the other. There are four assistant inspectors, three of whom never worked a day at plumbing, but were appointed by the Board of Health on account of their political services and not for their qualifications as plumbers. So it is clear to be seen why defective material is used in the construction of plumbing in Cleveland. But I do not think Cleveland is the worst. I see in the last issue of The Sanitary News that Detroit is in need of sanitary laws governing plumbing and for the sanitary conditions of Detroit in general, but my advice is, do not pass laws if you do not appoint men who are practically qualified to enforce them. Lay politics aside and appoint regardless of party.

The State Legislature of Ohio has passed a reform bill for the city of Cleveland which has abolished our present plumbing and Health Department, and we may be able to elect a man at the head of our city government who may have the ability and backbone to appoint men who are qualified to fill the different departments regardless of party—men who have the backbone to enforce the laws and regulations that come within their jurisdiction.

I might say a good deal more, but I have not the time. Hoping that I may have a chance at some future time, I am,

Yours respectfully,

W. A. Kelly.

CHICAGO MASTER PLUMBERS.

On Thursday evening, March 12th, the Chicago Master Plumbers assembled in Grand Army hall for their regular bi-monthly meeting. President Whiteford called a large number to order at the usual time.

Secretary Harry Black read the minutes of the last meeting which were duly approved.

Reports of the regular committees were received and adopted. Mr. Wade of the license committee reported progress in his work, and Mr. Culloton of the library committee reported that the committee was re-arranging the library.

The familiar face of John J. Cary, ex-secretary of the N. A. M. P., was discovered in the audience and on motion of Mr. Wade the gentleman was invited to a seat of honor on the platform with President Whiteford. Although urgently requested to make a speech he declined on the ground that he had been taken by surprise, and was not prepared to address the intelligent body of Chicago Master Plumbers.

Mr. Culloton of the Executive committee reported that a special committee had been appointed to present a special report which would be read under unfinished business.

Mr. Andrew Young informed the association that he had made arrangements with the G. A. R. people for the use of the anteroom for committee purposes, and that keys had been promised the chairman of each committee.

Mr. Murray of the Legislative committee read a proposed ordinance on plumbing, which had been prepared by the committee.

A resolution of the Ways and Means committee was brought before the association which proposed to make all meetings in the future rather exclusive. A warm debate on this subject seemed eminent when Mr. Culloton moved that the question be considered in executive session. The motion prevailed, and the representatives of the press slowly wended their weary way toward their respective homes at an early hour, leaving the result of the discussion as yet unrecorded.

PLUMBING NOTES.

Edwin J. Bradford will open a plumbing shop in Ravenswood, in the near future.

At a recent meeting of the council of Waitsburg, Wash., the city clerk was instructed to correspond with plumbers in reference to the construction of water-works now contemplated.

The firm of Fred Adee & Co., 90 Beekman street, New York, dealers in plumbers supplies and manufacturers of the "A. D." closets, have been dissolved—Mr. Smith, the junior partner, retir-

ing. Mr. Adee will continue the business at the same place and under the same name.

A pipe-coupling nipple, specially adapted where iron soil-pipes requiring lead calked joints are to be connected with lead pipe, has beed invented by John W. Daly, of Troy, N. Y. The device consists of a sleeve of hard metal encased within the nipple-shell of soft metal, providing sufficient strength to resist hammering when the joint is being calked, while furnishing a metal that can be joined to lead pipes.

Local Union No. 42 of the United Journeymen Plumbers' Association, at Lancaster, Pa., have elected the following officers: President, Harry Kiefer; vice-president, John Mussleman; treasurer, A. F. Beihl; financial secretary, William Johnson. For the above information we are indebted to G. E. Delmotte, secretary.

The records of Chief Inspector Young's office show the beneficial results of having plumbers for inspectors. We do not believe there is another city in the country that can make as good a showing. Such results following the services of the insufficient number of inspectors speak unmistakably of the high qualifications of the inspectors, and present the strongest possible arguments in favor of an increase of inspectors; for the work of this department is limited only by the possibilities of the present corps, employed to perform the vast services required by this great city.

A little germ in a sewer grew
And there increased to a million or two,
When all set forth, on mischief bent,
And ascended a pipe till they came to a vent.
They parleyed much which way to go,
Then started up the waste-pipe slow;
But a plumber there had set his trap,
With many a twist and bang and rap,
And into it the microbes flew
To the number of a million or two.
And then the flush came rushing down,
And thus the plumber saved the town;
For they were typhoid germs, they say,
That fell in the plumber's trap that day.

The young man beginning to learn the plumbing trade should remember that the day of the tinker in this branch of business is past, and he should become thorough from the beginning. Both mechanical and scientific knowledge are required, and a proper qualification in both makes the ideal workman.

There is a bill before the Legislature of Indiana, which has passed the Senate, designed to reorganize the State Board of Health by a clause providing for the inspection of plumbing in all the state buildings.

The city council of Fort Wayne, Ind., has passed the following resolution relative to the bill now before the Legislature of that state regarding plumbing: "WHEREAS, This council understands that a bill is now pending in both branches of this General Assembly looking to the regulation by law of the business of plumbing and house-drainage, and declaring under what conditions and restraints the same may be conducted; and, WHEREAS, Public health and welfare require the proper regulation of such business; therefore, be it *Resolved*, That the common council of the city of Fort Wayne does hereby urge and petition the General Assembly of the State of Indiana to pass such an act or acts as shall be necessary in the matter and business of plumbing and house-drainage as will protect the general public from the danger to life and health as incident to poor and defective plumbing and drainage."

Said the plumber to the gas-man:
"Have you my bill at hand?"
Said the gas-man to the plumber:
"Why, don't you understand?
I couldn't bring them both, you know;
I'm not so very strong;
So I had to leave the one at home,
And have lugged my own along."

F. H. Davis, corresponding secretary of the Nebraska Master Plumbers' Association, writes: The State Master Plumbers' Association of Nebraska held its annual convention at the Builders' Exchange, Omaha, February 19. There was a very good attendance, and the convention was one of the most enthusiastic ever held in the state. The afternoon session lasted from 2 to 5, and the evening session from 8 to 11. The following officers were elected for the ensuing year: President, James H. O'Neill, Lincoln; vice-president, M. A. Free, Omaha; recording secretary, W. R. Johnson, Omaha; corresponding secretary, F. H. Davis, Lincoln; treasurer, John Rowe, Omaha.

The master plumbers of Portland, Oregon, elected at their recent meeting the following officers: President, Alexander Muirhead; vice-president, Robert Brady; secretary, A. J. Lawrence; treasurer, A. Donnerberg; trustees, Wm. Muirhead, E. J. Floyd and John Hanford. Wm. Muirhead was elected state vice-president, to fill the vacancy caused by the death of J. J. Owens. Two bills are before the State Legislature – one to provide plumbing laws for Portland, and the other to secure the appointment of an inspector.

TRADE AND BUSINESS NOTES.

We have received from J. J. Wade & Son, 112 Dearborn street, Chicago, an illustrated catalogue setting forth the high merits of their well known and popular sanitary appliances. The first glance through the catalogue evidences the fact that the Messrs. Wade are abreast with the times in the production of useful, practical and scientific sanitary specialties. A closer examination shows a marked advance in the manufacture of these appliances in the matter of patent flushing arrangements, which will at once recommend them to the trade and public generally. The catalogue contains illustrations of flushing combined overflow basin traps, all earthenware combined bowls and traps, anti-syphon ball and basin traps, patent sewer flushing traps, manhole and flushing fittings, with back water or air valve to prevent sewer air or water from backing into cellar, etc. These devices must be considered as an advance in sanitary appliances, contributing to the safety and health of the household. The flushing system is carried ont in connection with cellar drain, soil-pipe, basin, closet, etc., and by the use of these patents everything necessary about the plumbing system can be flushed and kept clean, rendering the home healthful. Mr. Wade has worked on practical, scientific principles, and has produced what his long experience and intelligence have proved not only desirable but necessary in the hygiene of the home.

"Brick Pavements," by Prof. Ira O. Baker (Indianapolis: T. A. Randall & Co., publishers), is a pamphlet of forty-six pages, neatly printed at 25 cents. The subject of street paving is a very important one which has not heretofore received the attention its importance deserves. The above publication is timely and will prove of special interest to engineers, as it gives in a terse, yet comprehensive manner, the results of experimental tests made by the author, for the purpose of determining the relative value of paving brick as compared with stone, wood, and other paving materials.

The results, as shown in this little book, are surprisingly favorable to brick, and it will doubtless be accepted as a text book by all interested in that line. The high standing and reputation of Prof. Baker, the author, as a civil engineer, is ample evidence that the comparisons and statements are correct and authentic.

Mr. A. Hirth is the well-known and popular tackle and gun man of the old reliable house of A. G. Spalding & Bros., 108 Madison street, Chicago. Through his kindness we have had the pleasure of reading some very interesting and instructive literature relative to fishing, which reminds us that that delightful sport is near at hand as the seasons run. We hope its final arrival may relieve the tedium of the office and the weariness of the editorial mind with its inspiring and invigorating charm. The catalogue of goods of this house is complete, covering the full line of the best sporting goods on the market. Should any of our plumbing friends (and they are surely entitled to all the luxuries of this world), or any of our readers, desire the recreation that anglers know and grow fat on, and wish a reliable outfit, we would recommend them to give Mr. Hirth a call. He is a courteous gentleman, thoroughly understands his business, and handles perfectly reliable goods.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Pueblo, Col.: The Treasury Department has notified the Governor that steps are soon to be taken toward building the public building.——Sioux Falls, Dak.: Boulevard, frame residence; cost, $12,000; owner, E. A. Sherman. Ninth street and Dakota avenue, brick Y. M. C. A. building; cost, $30,000. Owner Y. M. C. A. South Sioux Falls: stone school; cost, $15,000. Board of Education, owner. Fifth street and Philips avenue, brick block; cost, $20,000. Rev. Edward Ellis, owner. Madison avenue, opposite court house, brick block; cost, $15,000. Baker Bros., owner. Phillips avenue between Seventh and Eighth streets, brick store; cost, $10,000. P. H. Edmison, owner. Duluth avenue and Ninth street, brick dwelling; cost, $15,000. C. C. Carpenter, owner. Duluth avenue, frame dwelling; cost, $15,000. C. E. McKinney, owner. Corner Main and Sixth streets, brick block; cost, $20,000. Willey & Williams, owner. Opposite above corner, brick block; cost, $20,000. A. C. Phillips, owner.——Baltimore, Md.: Southeast corner Charles street and Mount Royal avenue, six story stone and brick apartment house; cost, $75,000. The Arundel Building Company, owner, Northeast corner Preston and Hillman streets, two three-story brick buildings and two-story brick back building; James A. Pryor, owner.——Boston, Mass.: 70-72 Sumner street, brick apartment building; cost, $12,000. Samuel Goldenberg, owner. 142,146 High street, brick mercantile building; cost $75,000. Andrew G. Weeks, owner. Summer street, corner Devonshire street, brick alteration; cost, $15,000. Manufacturers' National Bank, owner. Washington street, corner Lovering place, brick mercantile building; cost, $37,000. J. J. Grace, owner.——Chicago, Ill.: Raeder, Coffin & Crocker have planned a large manufacturing plant for Frazer & Chalmers, to be built at Twelfth and Rockwell streets; there will be twelve principal buildings, all constructed of stone and pressed brick; cost, $1,000,000. Treat & Foltz have planned a three-story and basement flat building, to be erected at Sibley street and Vernon avenue by John Coughlan; pressed brick and stone construction; cost, $35,000; a four-story addition and an additional story for the building at 125 East 18th street, for S. A. McWilliams; cost, $7,000; a hotel, to be erected on Oakland boulevard, ten stories high; cost $500,000, O. W. Marble has planned five three-story and basement dwellings, to be erected at Grand boulevard and 41st street by Barry Bros.; they will be constructed of stone and brick; cost, $60,000. For the same persons, two dwellings at Grand boulevard and 43d street; cost, $25,000. J. J. Egan has planned a two-story addition and a Sisters' house, three story, to be erected in connection with St. Jarlath's School, at Hermitage avenue and Jackson street; they will be constructed of brick; cost, $30,000. C. M. Palmer has planned a four-story flat building, to be built at 22d street by Potter Palmer; pressed brick and stone construction; cost, $25,000. F. B. Townsend has designed a four-story and basement flat building, to be erected on Ogden ave., near Robey street, by Mr. Hood; cost, $25,000. H. B. Wheelock has planned a two-story and basement residence for Dr. S. Martin, to be erected at 3212 Lake Park avenue; it will be constructed of pressed brick and stone; cost, $25,000. Holabird & Roche have planned a two-story and basement store building for John Berry, to be erected at 581 West Madison street; pressed brick and stone construction; cost, $15,000. L. B. Dixon has planned three two-story and basement dwellings, to be erected on Forrest avenue, near 37th street, by George Sandilard; constructed of stone and hard wood; cost, $18,000. John Wagner has planned a five-story and basement business block, to be erected at Minneapolis, Minn., by Litgerwood Bros., of that city; to be constructed of brick; cost, $30,000. R. G. Pentecost has planned a three-story cellar and apartment house, to be erected on Prairie avenue, near 23d street, by Mrs. Sarah Valentine; brick and stone construction; cost, $30,000. A. Fiedler has planned a two-story factory, to be erected at 104–108 North Oakley avenue by M. Salomon; brick and stone construction; cost, $10,000. Frankel & Schmidt have planned a handsome three-story and basement store and flat building for Jerome Bowes; it will be constructed of pressed brick and stone, with first-class interior appointments; cost, $40,000. Julius Speyer has planned a block of two-story flat buildings, to be built at the corner of Francisco and Fulton streets by Henry McGurren and Roger Sullivan; to be constructed of pressed brick and stone; cost, $30,000. Worthman & Neebe have planned a three-story cellar and flat building for Henry Brasch, to be erected at 391 North Ashland avenue; cost, $12,000; also for Charles Henning, a three-story flat building, to be built at 86 Evergreen avenue; cost, $12,000; also a dwelling for George Kimball, three-story and basement; cost, $18,000. D.A.LaPointe has planned a three-story and cellar flat building, to be erected on West Harrison street, near Oakley avenue, by H. L. Hughes; cost, $7,000; also a three-story and basement for G. Franchere, to be erected on Ashland boulevard, near Polk street; cost, $15,000.——New York, N. Y.: G. A. Schellenger has designed for T. C. & George Edgar ten four-story brick and brown stone residences, with extensions, to be built on 75th street, 400 feet west of Ninth avenue. John H. Duncan has designed for C. W. Luyster four four-story brick and stone residences, with butler's extension, to be built on the south side of 74th street, between Eighth and Ninth avenues. Edward Wenz has designed for John Hickey two five-story brick and brown stone flats, with stores, to be built at a cost of $80,000, on the southeast corner of 110th street and Lexington avenue and the northeast corner of 109th street and the same avenue. Charles Sidney has designed for Charles C. Wendell a two-story frame hotel, to be built on Fort George avenue, between 194th and 195th streets, at a cost of $8,000. Henry Dudley has designed for Samuel Kempner two six-story warehouses, to be built at Nos. 63–69 North Moore street. Schneider & Herter have designed for Edward S. Updike six five-story brick and stone flats, to be built on the south side of 106th street, east of Fifth avenue.——Philadelphia, Pa.: Four factory buildings will be erected at the northwest corner of Leamy and Lippincott streets, by Contractor J. M. Anderson. An addition, costing $10,000, will be built to the Irvington House, Atlantic City, under the supervision of Architect Addison Hutton. A handsome house will be built at West Chester for the Principal of the Normal School, after drawings by T. Roney Williamson. The drawings for a residence, to cost $100,000, which will be built at Chestnut Hill, are now being prepared by Architect P. A. Welsh. Architect T. Frank Miller has drawings for a large two-story church and three-story school-building, to be erected on the northeast corner of 20th and Mifflin streets. The church will be built of bluestone, with Indiana limestone trimmings; will cover an area of 66x90 feet. The school-building will be 40x66 feet. On 20th street, south of Walnut, the Holy Trinity Protestant Episcopal Church, of Walnut and 19th streets, will erect a handsome four-story parish building. Ten dwellings will be built by W. A. Arthur & Bro; three will front on the south side of Filbert street, west of 52d, and seven on the west side of 52d, north of Market street. Architects Moses & King have plans on the boards for five dwellings, to be built near Moorestown, N. J. Ten twelve-room houses will be built at 34th street and Haverford avenue, by Wm. J. Shedwick & Bro. A number of small dwellings will be built at Ardmore, by Henry & Walter Bevan. Walter Burge will erect fifty-eight dwellings at the northwest corner of Wayne and Dennis streets. Three houses will be built on Orchard street, near Tacony, by F. M. Forsythe. B. Frank Livezey has plans for a dwelling to be erected at Doylestown, by Charles H. Rhoads. Architects F. L. & W. L. Price have plans for an addition to the Utopian Club-House, at No. 1417 Locust street, to include an auditorium and billiard hall. Four large houses will be built on the north side of Fairmont avenue, west of 11th street, by Samuel Hart. Upon the sites Nos. 808–16 North 20th street, five dwellings will be erected by Levi Koder. The drawings for edifice to be erected by the Western Methodist Episcopal Church have been prepared by Architect Thomas P. Lonsdale. Sixty-five dwellings will be built at 44th street and Mantua avenue, by Clarence M. Busch. At 38th and Reno streets, thirty-two dwelling-houses will be erected by Jacob Plucker.——Brooklyn, N. Y.: Lexington avenue, north side, east of Throop avenue, four two-story and basement brick dwellings; total cost, $14,000. David S. Beasley, owner and builder. Jefferson street, north side, west of Knickerbocker avenue, three four-story frame tenements with two stores; total cost, $17,000. Wm. Young, owner and builder. Macon street, south side, east of Ralph avenue, five three-story and basement brick dwellings; total cost, $22,000. John R. Pitt, owner and architect. Putnam avenue, south side, east of Stuyvesant avenue, five three-story and basement brick dwellings; total cost, $25,000. Chas. Isbel, owner and builder.——Cincinnati, O.: Architects G. & A. Brink have plans for the following buildings: Four-story tenement with store, to be located on Clark, near Baymiller street, for Geo. Rolff; cost, $5,000; 3½-story brick tenement for H. Rahe, to be erected on Sycamore and Miami streets; cost, $5,000; F. & F. Postel, 2½-story pressed brick dwelling, to be located on Mul-

berry, near Locust street; cost, $4,500; and block of three three-story pressed brick stores and flats for Phil. Nippert, to be located at Paris, Ky.; cost, $12,000. Architect John H. Boll has designed a five-story and basement factory for Joseph Schied & Sons, to be erected on Dunlap street, north of Findlay; cost, $10,000; schoolhouse to be erected in eastern part of Addison; cost, $10,000. Architect W. W. Frankein has plans for a brick and Buena Vista freestone dwelling for Henry Barth, to be erected on Evans street, Clifton; cost, $11,000; he is also preparing plans for a 2½-story pressed brick dwelling with stone trimmings, for J. Fred Waltz, to be erected in Elsmere; cost, $4,500. Architect L. B. Plympton has designed one double and one single brick and shingle dwelling for Jas. B. Daniels, to be built on Young street, Mt. Auburn; cost, $12,000. Architect Louis Piket has designed a five-story store and flats for Leonard K. Beahr, to be erected on Elm, near Green street; cost, $15,000.

HEATING AND LIGHTING.

Fort Dodge, Ia.: The question of an electric light plant owned by the city will be submitted to a vote.——Cuero, Tex.: A $15,000 electric light plant is in prospect.——Shelbyville, Tenn.: A bill has been introduced in the Legislature authorizing the erection of an electric light plant.——Augusta, Ga.: Address the mayor regarding the erection of an electric light plant.——Roanoke, Va.: G. L. Colgate has a franchise to erect a $100,000 electric light plant.——Salem, Va.: The Salem Electric Company has been organized with a capital stock of $100,000.——New Lewisville, Ark.: The Red River Lumber Co. wants prices, terms, etc., on electric plant.——La Grange, Ky.: The La Grange Electric Light Co. has been organized with $15,000 capital stock. I. T. Risley, president.——Vineland, N. J.: H. S. Foster and others have been granted permission to establish an electric light plant.——Rutherford, N. J.: The authorities have granted the franchise for a gas works to Mr. Van Steenbergh and others.——Wallingford, Conn.: The question of introducing electric lights is being discussed. The Rev. Father Mallon can furnish particulars.——Hillsboro, Ore.: It is probable that an electric lighting plant will be established. R. Case can furnish particulars.——Tacoma, Wash.: The Commercial Electric Light and Power Company has been formed with $250,000 capital stock. W. B. Bushnell is president. A plant will be established at once.——Monterey, Cal.: The Monterey Light and Development Company has been incorporated with a capital stock of $250,000. For particulars address Edward Ingram.——Melrose, Mass.: The Selectmen have voted to petition the Legislature for authority to build and operate, on municipal account, a gas and electric lighting plant.——Leavenworth, Kan.: The City Council has granted a franchise to Matthew Ryan, Sr., Fred R. Hunt and Matthew Ryan, Jr., to lay pipes in the streets and alleys for conducting natural or manufactured gas.——Dayton, Tex.: The question of establishing an electric lighting plant is being discussed.——Bristol, Tenn.: A company has been organized with a capital stock of $100,000, for the purpose of erecting a gas and electric light plant. A. H. Leftwich is president of the company.——Bellevue, O.: An electric light plant is to be established by the Bellevue Light and Power Company. Peter Brady can furnish particulars.——Newark, O.: The Mayor has called a special election, to take place March 14, to vote on a proposition to issue bonds for establishing an electric lighting plant.——Crawfordsville, Ind.: At a recent meeting of the council it was determined to advertise for bids for an electric light plant.——Abilene, Tex.: An electric light plant is wanted.

SEWERAGE NOTES.

Norfolk, Va.: The Norfolk Co. will construct a sewerage system through its property.——Lynchburg, Va.: The city council has voted $10,000 for sewerage improvements.——New Decatur, Ala.: The city has petitioned the Legislature for authority to issue bonds for the purpose of constructing a sewerage system.——Sulpher Springs, Tex.: Address A. P. Landers regarding particulars for a sewerage system.——Worcester, Mass.: Appropriations for construction of sewers for the year amount to $50,000.——Holyoke, Mass.: A new sewer is to be built on First street which will cost about $30,000.——Paterson, N. J.: A large sewer is to be built through Weiss street.——Waltham, Mass.: About thirty-five miles of pipe will be laid in the construction of sewers.——Taunton, Mass.: A sewerage system is wanted.——Elmira, N. Y.: Citizens will petition the Legislature for authority to expend $75,000 in the construction of sewers.——Philadelphia, Pa.: The Board of Surveyors has approved ordinances for the construction of a number of new sewers.——Fremont, O.: Bonds to the amount of $6,500 will be issued for sewers.——Tiffin, O.: Address Commissioner Chamberlain regarding the construction of sewers.——Bay City, Mich.: Address City Engineer regarding additional sewers.——Atlanta, Ga.: An appropriation of $143,000 has been made for sewers. About 25,000 feet of sewer pipe will be required.——Port Jarvis, N. Y.: A special election is to decide the sewerage question.——Reading, Pa.: The council has directed the City Engineer to prepare plans for house sewerage and storm sewerage for three sections of the city.——Manchester, Va.: Proposals are wanted for putting in a complete sewerage system at this place. Address Robert Nelson, city engineer.——El Paso, Tex.: A complete sewerage system is wanted for a $300,000 military post.——Baltimore, Md.: The mayor has recommended to the city council the appointment of a commissioner to investigate the subject of a general sewerage system.

WATER-WORKS NOTES.

Defiance, O.: The water supply system is to be enlarged.——Cincinnati, O.: The bill authorizing the city to issue $200,000 of bonds for the purchase of high pressure pumps for the reservoir of Eden Park, and for the extension of mains, has passed.——Blacksburg, S. C.: The question of water works is being agitated.——Greenfield, O.: The sum of $35,000 will be expended for water works.——Toledo, O.: The state legislature has authorized the water works trustees to buy additional pumping engines.——Northfield, Minn.: The legislature will be asked for a water works system.——Lancaster, Pa.: The sum of $125,000 has been voted to improve the water works.——Macomb, Ill.: April 1 the question of bonding the city for $25,000 for water works will be voted on.——Annapolis, Md.: New bids for water works will be asked, as the former ones were rejected.——Stratford, Conn.: The Citizens' Water Company has been formed.——Woonsocket, R. I.: Water works system will be enlarged.——Waltham, Mass.: An ordinance is before the council appropriating $20,000 for the extension of water works.——Lindon, Kan.: The Lindon Water Company has been organized with a capital stock of $10,000.——Waitsburg, Wash.: At a recent meeting of the council a committee from the board of trade was present to urge the council to take action to secure city water works. The clerk was instructed to correspond with civil engineers, and surveys and estimates are to be made as soon as possible.——Montrose, Pa.: Water works are contemplated.——Dansville, N. Y.: The question of water works is being agitated.——Wall Lake, Ia.: The question of water works will be voted on soon.——Mechanicsville, N. Y.: A movement is on foot to secure water works.——Somerville, Mass.: The city is considering the question of having water works of its own.——South Denver, Col.: One hundred thousand dollars will be expended for the extension of water mains.——Wilkesbarre, Pa.: The Honey Brook Water Company has been chartered with a capital stock of $10,000.——Bloomington, Ind.: The city has voted in favor of water works.——Corvallis, Ore.: The sum of $50,000 has been appropriated for water works.——Malden, Mass.: The city council has passed an order authorizing the water commissioners to issue $30,000 of bonds for water works.——Hancock, Wis., will ask the legislature for permission to issue bonds to the amount of $50,000 for water works.——Keyport, N. J.: The question of water works will be submitted to a vote of the people.——Seymour, Tex.: A proposition is to be submitted to the city for water works.——Asheville, N. C.: A bill is before the North Carolina legislature authorizing the city of Asheville to hold an election to decide as to the issuance of $640,000 of bonds, $100,000 of which are to be used for enlarging the water and sewerage systems and $500,000 for street improvements.——Shelbyville, Tenn.: A bill has been introduced in the legislature authorizing the construction of a system of water works.——Fort Valley, Ga.: H. C. Harris is president of a committee which will at once take steps to construct water works.——Nashua, N. H.: Address H. G. Holden in regard to the purchase of two miles of 24-inch water mains. Elkton, Md.: Water works will be constructed this year.——Sibley, Ia.: Address S. S. Parker in reference to the construction of water works.——Winona, Minn.: Address John B. Fellows regarding the extension of water works.——Santa Cruz, Cal.: About five miles of pipe will be laid this year. O. J. Lincoln, Supt.——Petersburg, Ill.: About ten blocks of mains will be laid. J. C. Bishop, Supt.——Cairo, Ill.: One mile of mains will be laid. Thos. W. Gannon, Supt.——East Lake, Ala.: The citizens have petitioned the legislature to

charter a company to construct a water works.——Brewton, Ala.: A bill has been introduced in the legislature to authorize the mayor and city council to issue $25,000 of bonds for water works and other improvements.——Auburn, Neb.: The city council has ordered a survey of the city and an estimate of the cost of putting in a first-class system of water works. The question of issuing bonds for building the works will be submitted to the people at the spring election.——Avoca, Ia.: Bonds have been provided to pay for water works, costing about $15,000, to be owned by the village. It is expected that contracts will be let shortly and construction begun so soon as the frost is out of the ground.——Union City, Tenn.: A water company has been organized for the purpose of erecting an electric light plant and to construct water works. The company has secured a twenty-five year franchise to furnish the city with water and light.—— Spokane Falls, Wash.: The city engineer has submitted to the city council two propositions, accompanied by plans, for the improvement of the present water works system. The first is to build a reservoir, with a capacity of 15,000,000 gallons, to cost from $175,000 to $200,000. The other is for an enlargement of the present system, with the addition of a powerful force pump to carry the water to the highest portion of the city by direct pressure.——Niles, O.: The water works matter will be submitted to the vote of the people here at the spring election.——St. Joseph, Mo.: The St. Joseph Water Company will lay a new supply main from the reservoir to the city.——Topeko, Kan.: A new irrigation and water power company has been formed for operating in all parts of Kansas in constructing and maintaining dams, race-ways, aqueducts, canals, wells, and such other works and appliances as may be required for the collection, conveyance and use of water for manufacturing, water and water power, and for utilizing and supplying water for the purpose of irrigation. The company is organized with a capital stock of $1,000,000, and will have its headquarters in Topeka. The incorporators are T. D. Thatcher, W. A. L. Thompson, W. Tweeddale, and others.——Elgin, Ill.: Numerous water main extensions are to be made. For particulars address Mayor Price.——Lima, O.: There is talk of holding a public meeting for a general discussion on the question of enlarging the water supply. H. J. Lawler can furnish particulars.

BIDS AND CONTRACTS.

Groesbeck, Tex.: On April 3, the county commissioners of Limestone county will let the contract for a court-house, not to exceed $65,000.——Tiffin, O.: Proposals are wanted until March 21 for the construction of certain sewers. Address Jeremiah Rex, city clerk.——Sonora, Tex.: The county commissioners of Sutton county wish to contract for a court-house, not to exceed $40,000 in cost, and will receive bids until March 31.——Washington, D. C.: Proposals are wanted at office of building for Library of Congress, 145 East Capitol street, for the following heating and power apparatus: Class 1—Shell boilers, fronts and trimmings, water-heaters, tanks, etc. Class 2—Cast-iron flange-pipe, hot-water coils, manhole doors, etc. Class 3—Fittings for wrought-iron pipe, valves, steam traps, galvanized sheet-iron pipes, etc. Class 4—Wrought-iron plain and galvanized pipe. Specifications, general instructions and conditions and blank forms of proposals may be obtained on application to this office. Bernard R. Green, Superintendent and engineer.——Sulphur Springs, Tex.: Proposals for a system of water-works, sewerage and electric lights will be received until April 1. Address W. F. Henderson, Mayor.——Galveston, Tex.: Proposals are wanted, until March 30, for the delivery of about 1,000,000 tons of stone and concrete blocks for improving the entrance to Galveston harbor, Texas. Address Charles J. Allen, Major, Corps of Engineers, U. S. A.——Port Arthur, Ont.: Proposals are wanted until April 1 for furnishing 273 tons of the best steel rails. Address W. H. Langworthy, town clerk.——Orlando, Florida: Bids for the construction of a court-house are wanted till March 21st, 1891. Address C. F. Smith.——Cincinnati, O.: Bids for street improvements are open till March 26. Thomas E. Smith, Board of City Affairs.——Elkin, N. C.: Prices on dynamo and fixtures for a 15-arc and 200 incandescent electric light plant, f. o. b., are wanted by T. J. Lillard.——New Louisville, Ark.: The Red River Lumber Co. wants prices and terms on an electric light plant.——Morgan, Tex.: J. E. Moss wants 150 tons of water-pipe, 12 inches in diameter, ¾ inch thick, and weighing 90 pounds per foot.——Fort Niagara, N. Y.; Sealed proposals, in triplicate, subject to usual conditions, will be received at the office of post quartermaster, Fort Niagara, N. Y., until 12 o'clock noon, Eastern time, on Monday, March 30, 1891, and then opened, for the construction at Fort Niagara, N. Y., of two double sets of officers' quarters, of frame, and two barracks, of brick, and a brick building containing water-closets and urinals. All information furnished on application to quartermaster at post.

KOCH'S LYMPH.

Dr. Koch's lymph will doubtless prove a great boon to suffering humanity, but it is yet in the experimental stage. The remedial value of the waters at Hot Springs, Ark., has been demonstrated. This great health and pleasure resort is reached directly via the Wabash road. Compartment sleepers Chicago to St. Louis, where direct connection is made with a double daily line of sleepers for Hot Springs. Berths reserved through.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, Ohio.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

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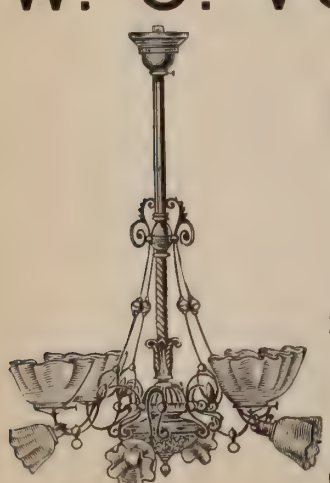

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BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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IT will pay more in the valuation of a building to have it plumbed properly than the plumbing will cost. A building in which the plumbing is bad will have its value diminished to the extent of putting in a new system, to which must be added the cost necessary for house repairs.

IT is a good sign to see city authorities open correspondence with plumbers in regard to the construction of water-works and sewers, as some cities are doing. The most important part of such construction is necessarily left to the plumber. But little is accomplished when water-works and sewers are built. The greater work is still to be done, and that consists in uniting the two in order that each may be serviceable. This work devolves upon the plumber, and here lie the dangers that are to be avoided in the whole matter. Sewers fill an important mission when the house-drainage is properly constructed; but when it is not, the sewer can become the agent of much mischief. It is important, therefore, that the co-operation of the plumber be obtained in this important work.

ACCORDING to the opinion of New York builders, the spring season will be dull, owing to the state of the money market, the recent overbuilding, and prospective labor troubles. In Chicago, the season promises to be brisk. A large number of building permits are now being issued. Permits for the last two months were issued to the extent of 944—this being 218 more than were issued during the same period of last year. There are present indications that this state will continue, and that the present season will be a very active one.

IT is hardly a part of the present-day intelligence to enact laws governing plumbing, to provide rules and regulations by which its constructions is to be governed, and then appoint for the inspectors of the work men who do not know a closet from a sink. The operation of plumbing laws and regulations, to be effectual, must be harmonious and symmetrical in construction and enforcement. This state of affairs cannot exist where a reputable plumber must have his work inspected by a disreputable, political plug-ugly, or any one not qualified to discharge this special duty.

THERE is probably not a city in the whole world that can make as good a showing in the matter of plumbing inspection as Chicago can. Yet there is room for improvement here. Inspector Young has gone as far as he can, and has attained as near perfection as is possible, with the limited number of plumbing inspectors under his able direction. The city needs more inspectors, and it is hardly probable that this important work will be neglected on account of an insufficient number of inspectors. Our council is too intelligent for that.

SANITARY science is based on enlightenment, and is not promoted by compulsion. Yet it is true that many of its requirements must be enforced by legal enactments and the penal code. In this respect it does not stand alone; nor is this feature in the fulfilment of its mission evidence that it is not based on the better education. Every act that goes to make up good citizenship is in accordance with some statute, and the compliance with the requirements of good citizenship cannot be disregarded without a violation of some penal law. Thus, law is a necessity, both as a rule of right and for application in emergencies. So it is with sanitary science. It is not a creation of law, depending for its existence upon legal enactments, but it is the creature of intelligent discovery and establishment, having its rules enforced by legal authority for the good of the people. So, while the people are being educated as to its beneficent offices and importance, its rules of right living should be enforced by the authority of legal power.

THERE is a general sentiment throughout the larger cities in favor of plumbers for the inspection of plumbing. While this important reform is strongly urged by the master plumbers of the country, the necessity for it, and the common-sense reasons for it, have been sufficient to arouse the proper consideration of health-boards and municipal authorities, and secure their favorable judgment regarding this step in the progress of sanitary interests. Whenever a non-professional has been appointed health commissioner or president of a board of health, a howl has usually gone up from the physicians of the country, and the appointment denounced from the street-corners and house-tops; but when a blacksmith or a political bummer has been appointed to inspect plumbing, a criticism of the appointment was considered high treason. This unfortunate state of affairs is happily passing away, and better judgment prevails. The sentiment will grow until plumbing will be inspected by inspectors who know their business and how to perform this service understandingly.

CLEANLINESS A FACTOR OF VALUE.

Dirt has been defined as substance in the wrong place. Soil, which would be considered obnoxious in the house, is valuable in the field. The offal in the streets is a nuisance and a stench, but on the garden becomes a factor of great value. Nothing can be more useless and valueless than a substance out of the place for which it was designed. It is not only valueless in itself, but it

detracts from the value of articles with which it comes in contact. The merchant understands this, and keeps his stock free from the litter resulting from the necessities of trade and the daily accumulation of dirt. The shop-window that is clean and tastefully arranged is inviting, while the dingy, smoky, dirty window is repulsive. The former constantly draws trade; the latter naturally repels it. Clean and bright commodities will bring a better price than the same goods covered with dirt. Jewelry of the purest gold is cheapened by the accumulation of the commonest kind of dirt.

An example of the worthlessness of substances in the wrong place is seen on a larger scale in our cities. The condition of streets and alleys has much to do with the value of property. Along our boulevards and special drives, where the streets are carefully swept and cleaned, the sidewalks properly cared for, the alleys and yards well attended to, the price of property and rents are much above that which is found in the dirty and neglected portions of the city. A dirty street is avoided not only for pleasure and business, but a residence situated thereon, whatever the quality of its finish and appointments, is undesirable and will not bring its true value, owing to the detraction of the surrounding dirt. The value of every article on the market is in direct proportion to its cleanliness; and as some portions of a city are more valuable than others, so is the whole of some cities of more value than that of others. There are towns scattered over the country so dirty and ill-kept that their progress is slow and their prosperity is continually retarded. Dirty and torn-up streets, with a general dilapidated condition of things, retard progress, prevent improvements, and the people cling to the coarser necessities of life. Dirt and prosperity are not at all companionable, and cannot dwell together. Cleanliness is the ever-present handmaid of prosperity, while sloth and decay are the attendant evils of dirt and neglect.

This being true of dirt, of how much more importance is the subject clothed when this dirt becomes vile filth dangerous to health! Then, we have added to the value of cleanliness that of healthfulness and the vigor and energy attending it. All this is a factor of value too often unconsidered by those who are otherwise careful regarding the elements of importance attending business, and the interests with which they are connected. Municipal authorities and citizens grow indifferent concerning the cleanliness of cities, apparently unmindful of the detractions of filth and the low conditions of health. Public improvements are advanced to give progress and prosperity to cities, while the neglect of streets and alleys alone is a greater pecuniary loss than the improvements are gains. Money is spent freely in other directions, when the factor of greatest value, cleanliness, is overlooked. The "good citizen" would rather see a large building than a clean street, and the authorities do not know that they are rendering the greatest possible service when they are keeping the city clean. As an investment, it will pay a larger per cent. than any other, and should receive first consideration.

WHO IS RESPONSIBLE FOR BAD PLUMBING?

There is no excuse for bad plumbing. The complaints of sewer-gas entering a house and the evil effects of poor plumbing is a reflection on the employer who engaged the plumber. We do not say that every man who does plumbing work is thoroughly qualified, responsible and reliable, but we do say that there are men in the trade to do all work who can be relied on to do thoroughly good work, if they are permitted to do so. This is true in all business. There are enough men in every profession, trade or business to accomplish all that is demanded, and in a proper and safe way. Go into any profession or trade and you will find the good, bad and indifferent. You can select your choice and pay about your own price, but it is not at all probable that your price will secure the best work. So it is, in the plumbing business, that we find men capable and willing to do almost any kind of work demanded of them, from the poorest to the best. There are men in the trade who do not pretend to do good work, and there are men who will not do inferior work. From this range of workmen—from the worst to the best—the employer can select. He can get the best, which is a guarantee of good work, or he can get the worst, which is a guarantee of bad work. Thus it is that the employer, the man who has plumbing work done, is responsible to a great degree for the character of the work performed.

There need be no mistake made in the employment of any man in whatever capacity. Every man has his standing. Public opinion has placed the measuring-rod against every man's character and qualifications, and his stature is known. His record is known, and the public seal of approbation or condemnation is upon him. He is graded and properly labeled in the great classification of humanity, and no mistake could be made in locating him. It matters not what his pretentions may be; he is as his neighbors know him, and, regardless of his own advertisements, he stands to the world thus catalogued. No man is wholly unknown. Some place his record is kept faithfully, and is as true as the story of an eye-witness. Regardless of his representations, his value is no more than the estimate placed on him by public opinion. Man is a part of a community, and the community consigns him to a specific and definitely defined part. The decision of the community can be taken as correct. The community is an encyclopædia of every individual in it, and he who studies it properly will not be deceived regarding its individual members. Thus it is that one man is enabled to select whatever qualities he may choose. If a plumber be wanted, it will be found that each has his standing. There is no guesswork about it. The men will be pointed out on whom reliance can be placed—in whom the confidence of all is rested. In making such a choice, there is the least possible chance of making a mistake.

There is another reason why the employer is often responsible for the character of plumbing he procures. There are grades of work, grades of material and grades of prices. The lowest price will not procure the best material and work. The converse of this is not necessarily true, but chances of getting poor material and work for first-class prices are remote. There are plenty of men in the plumbing business who can be thoroughly relied on to furnish exactly what they contract for, and as long as this is true the man who has the work done cannot be relieved of his responsibility. It is, of course, possible for the builder to be deceived in the character of work, but, as a general thing, if he be deceived in the plumber he employs, it is his own fault. He need not be, for he can easily find a man who will do the work according to agreement, and on this he can rest assured. The question of paying for good work is a serious one, inasmuch as the builder too often wants to pay the least amount possible. In plumbing, as in everything else, the best cannot be procured for the least money. If the best is desired—and none other should be had—the best price must be paid. This is true in everything, and there is no reason why an exception should be made in plumbing. "The best is the cheapest" is a rule that is correct in a twofold sense in the matter of plumbing. In the first place, first-class plumbing is the most durable, costs less for repairs, needs no remodeling, and is not responsible for the payment of doctor bills. In the next place, it gives a sense of security and comfort that is worth more than all else, and it secures health against the evils of imperfect drainage, which in itself is a factor of great value; for ill health is not only expensive, but non-productive.

There are builders who are speculative, and build for others. They secure the cheapest plumbing possible, and allow others to suffer the evils of it. There are also alleged plumbers ready to do this work. Here the builder is wholly responsible; and this evil should be remedied by rigid legal enactments specially fitting the case. The larger portion of plumbers—all the reputable ones, all who properly come under the name—favor good work, and are continually striving to establish a proper standard of plumbing; and they succeed as the people become educated regarding the importance of their services. Thus the responsibility shifts from the shoulders of the plumber to the persons who have the work done; and so long as it is possible to procure good plumbing, so long will those who do not secure it be at fault.

NOTES AND NEWS.

More than 500,000 houses have been built in London during the last forty years.

The English authorities are investigating the habit of ether drinking, which is said to be spreading in that country.

The carbon monoxide gas given off by gasoline stoves is so fatal that one inhalation may suffice to destroy human life. The

greatest possible care must be taken to insure thorough ventilation when such are used.

The London Vegetarian Society reports a membership of 541 but the movement is said to have spread throughout England Europe, and the colonies.

Cold copper wire offers less resistance to an electric current than a hot wire. The resistance increases at the rate of about 1-5 per cent. for each Fahrenheit degree of rise in temperature.

A novel arc lamp was receetly exhibited in London. It is worked by a selenium cell on the principle that the strength of current varies with the intensity of the light falling on the selenium. When darkness comes on it lights itself, and when subjected to daylight or other light it extinguishes itself.

A German physician proposes that the manufacturers of preserved meats should be compelled to stamp their cans with a legible date mark. For a year or so, he says, canned meats may remain perfectly wholesome, but after that they deteriorate in a way defying alike precaution and explanation.

An alloy, the electrical resistance of which diminishes with increase of temperature, has recently been discovered by Edward Weston. It is composed of copper, manganese and nickel. Another alloy, due to the same investigator, the resistance of which is practically independent of the temperature, consists of 70 parts of copper combined with 30 of ferro-manganese.

An ingenious "cut off" for electric light fittings has been invented by Mr. W. Hall, of 88, The Close, Claphan. Its novelty consists in securing the lead wire by two eccentric pinches, and in the fact that, should the wire melt from over current, the cover (which has an internal stud resting on the wire) will fly down, thus indicating what has happened.—*Invention*, London.

A mineral discovery of unusual value is reported from Kamouraska, in Lower Canada. A Quebec correspondent states that an entire mountain has been found composed of silicates, otherwise known as vitrifiable stone, of a purity certified by the provincial engineer to average 98 per cent. This material is used for the manufacture of the finest glass, and is believed to exist nowhere else on the American continent in such purity.

It is sometimes necessary to locate the position of the center of gravity of the section of an angle or T iron. The following rule may in such cases be found useful in the case of equal-sided angles and T's: Let B = breadth of side and t = thickness of metal. Then distance of center of gravity from the outer surface of one flange of the angle iron or of the table of the T iron is $\frac{1}{4}$ (B + 3 2 t). This rule is a very close approximation.—*Engineering*, London.

Measurements made at some of the brick-yards in Findlay, Ohio, indicate that the amount of gas used to burn a thousand brick is 7,500 cubic feet, independent of the amount used for power in preparing the material. The rates have been as follows: For brick burned in open kilns twenty-five cents per thousand, and for brick burned in closed kilns, twenty cents per thousand. At Fostoria the rate is fifteen cents per thousand. At Tiffin the rate has been fifty cents per thousand. The charge for seven drain-tile kilns at Tiffin is $50 per month. It is estimated that the consumption of gas in brick-making alone, at Tiffin, is not less than 1,000,000 feet per day during the busy season.

There is a popular notion to the effect that a person is more likely to take a contagious disease when the stomach is empty. Although this fact seems to be well established by experience, nevertheless it has never been established as a scientific fact until recently. Experiments which have lately been made upon pigeons, by two Italian physicians, demonstrate beyond any reasonable doubt that hunger is favorable to the activity of the infectious element, whatever it may be. Pigeons that had been starved, were found to be very susceptible to the contagion of anthrax, although when well fed, they were not at all subject to this disease. It thus appears that hunger in some way lessens the ability of the body to defend itself from the attack of disease germs. Possibly this may be in part due to the fact that when a person is hungry, there is no gastric juice in the stomach, so that the protecting influence of this digestive fluid is lost. Then, too, the lowering of the vital powers as the result of hunger, lessens the resistance of the cells of the body in general.

A trial was made recently at the premises in Park-row, Leeds, lately occupied by the Prudential Insurance Company, of a coal-saving composition which has been invented by Mr. W. C. Owston. The composition, says the *Iron and Coal Traders' Review*, is a chemical compound resembling fine sand, and one of the principal properties claimed for it is that when sprinkled on an ordinary fire, after it has been made up, it ensures thorough combustion, all the gas and tar, which in the ordinary way is allowed to pass off in smoke up the chimney, being consumed. The *modus operandi* is very simple, all that is required to be done being to sprinkle about half an ounce of the composition over the fire. A chemical reaction takes place in the coal, and the top of the fire becoming cemented together, gradually consumes all of the tar and black smoke given off; while the heat, instead of escaping through the top of the fire, is thrown out into the room. After the fire is about half burnt out, nothing but coke remains, and it gives off a great heat. The composition is not, however, suitable for use with a coke fire.

The *Chemical Trade Journal* describes a new fire-alarm called the "admonitor," which is the invention of Mr. Agerskov, of Copenhagen. The device consists of a copper cylinder, resembling in size and shape a pistol cartridge. The copper cartridge shell is closed at one end, and stopped at the other by an indiarubber button. It is filled with a slowly burning composition of high illuminating power, on the top of which is placed a fuse composed of a mixture of two parts of chlorate of potash and one part of sugar. In this mixture is imbedded a drop of concentrated sulphuric acid enclosed in a film of paraffine. The almost perfect insolubility of paraffine in sulphuric acid assures the integrity of the little capsule so long as the temperature remains below the melting point of the paraffine. This is about 135 deg. Fahr.; and when the temperature of the place in which the "admonitor" is placed rises to this point, the paraffine gives way, permitting the sulphuric acid to act upon the chemical fuse, which ignites the luminous composition—the plug being at once driven out, and the alarm given by the light.

SANITARY NECESSITIES.

The following appeared in the *Inter Ocean* of the 17th, and appeals directly to every citizen of this city:

It is but natural that our citizens should desire that Chicago should present her best appearance during the World's Fair, when she will be the Mecca toward which all footsteps will bend. Pilgrims from every country and every clime—from the Orient, resplendent with traditions of past magnificence; from Egypt, that ancient home of civilization, enlightenment, and art; from Greece, where poetry and science were first cradled; from the islands of the sea and from India's coral strand, the magnificent caravan will come, bringing with it the choicest treasurers that ingenuity can devise, industry construct, or wealth procure. Those who will bear these treasures have been accustomed to the splendors of ancient cities and to the luxuries of wealth and refinement. It is desirable that they carry away with them favorable impressions of our young and vigorous metropolis, and to that end it behooves our authorities to take such measures as will add to the comfort, the safety, and the elegance of the city. It is not necessary that a lavish expenditure be made. The natural situation of itself is adornment, of which most municipalities would be proud. Yet it should be borne in mind by our citizens and impressed upon our officials that the future great city of this Republic, if not of the world, will be that city whose sanitary laws afford protection to the workshop, the office, and the home—a city whose garbage and ashes and all unsightly and unseemly debris will be removed, and its streets and alleys swept and cleansed during the midnight hours; its sewers flushed and disinfected regularly; its residence streets shaded and cooled in summer by umbrageous trees, whose properties are invigorating and health-giving—the very face of nature changed to meet the requirements and conserve the comfort of its inhabitants. Such a city would be a magnet to draw to its bosom the wealth and culture of the universe; and with its highways graced by institutions devoted to the arts and sciences, and to the promotion of learning—in such a city genius would find a fitting abode, civilization would ascend its throne, and learning receive such recog-

nition as it deserves. Let us be up and doing that we may attain a consummation so devoutly to be wished.

An intimate acquaintance with the sanitary needs of this city, derived from an experience of more than two years in the Dement of Health, has impressed me with the necessity that exists for a thorough cleansing of the streets and alleys, a purging of the sewers and their connecting drains, and the inauguration of a systematic plan of drainage which shall reach even the remotest streets which human beings make their places of abode. As a little leaven will leaven the whole lump, so it often happens that faint and almost imperceptible germs of disease sometimes permeate an entire community, generating pestilence that may cost thousands of valuable lives. Money expended in the purification of our homes and our streets is well invested. Delay at the present time in providing for the future in this respect may not only be dangerous but fatal. A liberal and intelligent policy directed toward the thorough sanitation of Chicago will make her not only the most attractive, but the most healthful municipality on the continent, and lead to results that will call forth the blessings of posterity upon the heads of those who now have the conduct of affairs in hand. Let all the known appliances of science be employed to purge the city and keep it in good condition, and none will have occasion to regret the trouble or begrudge the cost. Such a policy is dictated alike by self-interest and a regard for the general welfare of all who may in the future have business relations within our borders.

The ordinance now before the council provides for a sanitary corps of twenty-five practical men whose greatest qualification for the positions shall be their knowledge of the duties of the position. With such a force I will guarantee a reduction of the death rate, less sickness among the dependent, and consequently a saving of the money now expended for their care in public institutions. This ordinance, in view of the sterling benefits it will confer, should receive the support of every humanitarian. Health is a capital for the community as well as the individual, and neglect of proper precautions by the municipality is murder under an alias. I bespeak for this measure the favor of your paper. A. Young, Chief Inspector Dept. of Health.

WATER SUPPLY AND ITS DEVELOPMENT FOR SMALL CITIES IN THE WEST.*

The object of the present paper is to consider in a popular way the development of public water supplies, particularly with reference to the many progressive towns in this portion of the West. So many towns have failed to realize their anticipations in securing a public water supply that the town authorities seem either to have been ill-advised or to have misapprehended actual conditions; some cases of failure are directly due to inappropriate methods of development. An experience gained by one of several successive failures is expensive and undesirable. Small towns can ill afford to pay for information on such matters two or three times its market value. It is much better to preclude failure by a thorough and systematic investigation.

No matter what the size of the town may be, this question of water supply so involves the health, happiness and protection of the community that it demands the best and most disinterested consideration of town authorities. Small communities relying on cisterns and wells often cling to them when the growth of the town should encourage better protection. Cisterns are usually for the storage of rainwater, and many suppose that from this source comes the purest and best supply for domestic uses. This view is all very proper when it refers only to the use of water for ordinary kitchen purposes; but if it includes its use as a potable water it is an erroneous one, for the reason that noxious and soluble gases and fine dust emanating from animal and vegetable life, from the decay of organic substances, from the disintegration of mineral matter and from fuel combustion, are as native to the air as sediment is to a flowing river, and the rain as it descends absorbs these atmospheric impurities, surrounds them with conditions favorable to chemical action, and reaches the earth in a state of greater or less impurity.

Even this source of pollution need not render rainwater in the vicinity of small towns unfit for a general domestic use were it kept from other contaminations, but, on the contrary, by contact with painted and dirty roofs and gutters on the way to the cistern and the great liability of these receptacles to the percolation of surface water, additional sources of pollution are encountered. Within the cisterns the conditions are unfavorable for the circulation of air and water, and any gases arising from the enclosures are readily absorbed. Thus it is that rainwater, by the time it is used, can become exceedingly impure.

Open wells draw towards them the ground water from considerable distances in all directions, and when in the vicinity of cesspools and privy vaults become a receptacle for their subsurface drainings. It is commonly thought that water by percolating through the ground will become pure. This idea, however, must have its limitations, since water to be purified by natural filtration, must pass through porous and well drained soils permitting of a free circulation of air, and the process of oxidation; but when draining through or from deposit vaults into the deep sub-soils, it is simply filtered and may enter a neighboring well perfectly clear but most dangerously foul with matter in solution. Even drive wells, with an iron-encasing tube, are not exempt from such dangers of pollution, because there being no storage capacity to a drive well as to open wells, a depletion of the soil extends in all directions immediately upon draught, and this depletion is more extended, the greater and more continuous the operating power attached to the well, so that it is only necessary for the drainage from vaults in the vicinity to reach this affected district in order to find access to the well.

Cisterns and wells are, of course, a necessity in the early history of a community, but they demand constant vigilance as the price of freedom from contamination, and in estimating the quality of the water from either source, it is never safe to depend on appearances, for though the water from them may be clear and sparkling, it is not, for all this, necessarily pure; even sewage may be clear as crystal. But methods of water supply can well be discarded for everything but the ordinary house uses as soon as the town can afford to procure water from safe and reliable sources. The waters of drainage and percolation, collected naturally in rivers, lakes and in porous sub-soils are the immediate source of large local supplies, and may be divided into surface and subsurface supplies, and even these facilities are more or less limited according to the locality. Of the surface supplies the best comes from some one of the great rivers. These waters, by flowing over and through uneven beds of silicious sand and gravel of considerable slope, and by being brought continually in contact with the air, are freed from organic matter by oxidation. The retained impurities are chiefly sediment in suspension, which are readily disposed of by settlement in basins or by filtration. What hardness there may be in such waters is usually not sufficient to interfere with general domestic service. The intake from such a source should be located in a main channel, and at a point above the town, where pollution from sewage and manufacturing waste cannot reach.

Lakes in this central-western district, if they exist at all, are usually unfit for furnishing good water and can scarcely be considered here.

Circumstances sometimes favor impounding reservoirs, which store surface water collected from a more or less extensive watershed. Such supplies are desirable where the impounded water can posses depth, at the expense of superficial area; and can be free from contact with vegetable soils and polluted surface drainage. When the drainage valleys are broad the stream burdened with sediment, the vegetable soils deep, and the subsoils porous, the conditions are very unfavorable for the construction of dams and the storage and maintenance of pure water. Many inland towns are so situated that surface water either cannot be obtained at all, or it is at an expense beyond their present means; consequently resort must be had to sub-surface supplies; and these may be both from deep and from shallow sources.

The deep sources furnish water by means of artesian wells, from the ancient geological formations, consequently it is liable to the impregnations of mineral matter. The shallow supplies, often in considerable quantities, come from the drift formations of sand, marl and gravel from 50 to 150 feet in depth, and are usually good for all house purposes. In locating a water supply of this

*Read before the Engineers' Club of Kansas City, by Wynkoop Kiersted.—From the Journal of the Association of Engineering Societies.

kind, caution is to be observed, for absolute reliance on a yield from such a source is extremely hazardous unless preceded by a thorough and skilled investigation.

In the first place the laws governing ground water flow are practically the same as those governing the flow of surface waters. The movement of the water through the ground, however, is very slow, due to the great resistance of the soil; and this resistance varies with its degree of fineness—for instance: water will pass very freely through a mass of boulders or coarse gravel; more slowly through sand; the rate of flow decreasing as the material becomes more finely divided; clay permitting very little to pass. Much also depends on the extent of the water bearing material; whether it is an extensive reservoir, holding water collected from many square miles of water shed, or is simply a pocket supplied in the immediate locality to become exhausted by a short season of pumping or during a drought.

It is evident from the character of such rivers as the Platte, Republican, Kansas and Arkansas, that the porous soils under and on either side of them must be in a continual state of saturation, and constantly transmitting the waters collected from rains on inland districts; otherwise the water in the river basins would entirely disappear by downward filtration. The fluctuations of the rivers depend largely upon the degree of this saturation, and upon the extent of these storage reservoirs. Generally in these broad valleys almost inexhaustible supplies of water can be obtained, in degress of purity depending upon the amount of vegetable, animal and mineral matter that is encountered in the soils. The same is true of the tributary streams and valleys, except that their supplies come from more limited water-sheds, percolate nearer the ground surface, and are consequently more affected by drought. Inland towns can often be supplied from the same subterranean reservoirs as the river towns, but in this case the depth of penetration is usually greater, with a proportionate increase in attendant risk and expense.

It may seem that these few statements of the general distribution of a ground water supply are opposed to the necessities of the tests heretofore referred to, but this is only apparent; for, while a knowledge of the geology of the country, of the meaning of surface appearances and of the existence generally of large subterranean reservoirs is essential, and suffices for predictions, it is not positive information. There is always a lack of homogeneity in the deep sub-soils, faults in the geological structure, natural upheavals and other disturbances, which, like boulders in a surface stream, so prevent an uninterrupted flow, that tests in any locality are essential to establish conclusions. When so much depends on investigation and actual test before the location of a water supply and the means of developing it can be settled, it is difficult to tell why it is that communities will often be satisfied with a sort of "Witch-Hazel" location, and accept almost any device for securing the water, without a proper consideration of its adaptation to existing conditions. It is to be regretted that such cases are not few, and always involve a fruitless expenditure of public funds.

The common practice of locating a water supply on the public square, or on some vacant lots within the corporate limits of the town is a most precarious proceeding. Usually it is for no other reason than to reduce the first cost of the works, or because the man who makes the investigation does not receive remuneration enough to pay him for the trouble of investigating a water supply outside the town limits. While considerations of economy are good, and are particularly necessary with small communities, they lose all force and argument when opposed to the health and comfort of the public. This water must surely be drawn from under the town, and most certainly will be polluted by the drainage from privy vaults and cesspools. This danger has undoubtedly received little thought from the authorities accepting such a location, and no doubt many will scout the idea, but from the very fact that it is danger, a positive danger, unseen and unfelt until it appears as an epidemic among the people, renders the duty to avoid it an imperative one.

As a matter of fact, a public water supply is usually from the deeper water bearing strata, which are often separated from each other by layers of clay or a mixture of clay and sand, but frequently of insufficient thickness to prevent inter-communication. A circulation of water which may have been impracticable or impossible before the construction of a system of wells, is, by their existence in many instances, made not only possible, but probable; for the reason that in piercing the various strata, a channel is opened for the passage of the upper water to the inlet of the wells.

A continuous draught drains the surrounding ground for many hundred feet, producing conditions favorable to a downward percolation of water, so that any drainage from underground receptacles of filth, by the slow process of filtration, is liable to reach the affected district and ultimately to find access to the homes of the community. As a rule, the best location for a water supply is in the main drainage valley, or in one tributary to it above the town site, for there the danger from underground pollution is diminished, and the expense of interception the least. Objections are often raised to such a location near a stream, because the water in the river, by an occasional foulness, may be liable to taint any supply in its vicinity. Such objections, though plausible, may frequently be rejected, because experience in various instances has shown that filter galleries, even though located close to a river and below the low water line, receive the greater part of their water from the land side.

[Concluded next week.]

HEALTH AND INTERIOR DECORATION.

Prof. G. Atchison says in the *Popular Science Monthly* that in using decoration we are strictly following nature, who not only makes the most of her works of beautiful forms and of beautiful color, but enriches them with a variety of texture, of patterns and of colors that would in man's work be most strictly decoration. No doubt some of this is protective, but much also, as far as we can judge, is purely ornamental. What may be called formal ornament is the application of certain observed facts in nature that please. Up to a certain point, the repetition of some simple form is pleasing. Lines are said to be divided harmonically when they have certain ratios to one another, and spaces may have similar proportions, and these as well as certain curves give more pleasure than others. The combination of some flat and sharp curves is also found to be beautiful; the contrast of certain forms and of certain colors also gives pleasure.

It is the application by man of these observations, properly worked out to things he wants, that makes them ornamental, and their superposition on elegant forms is said to decorate them. That which is most perfect in ornament is the work of people gifted with high artistic fiber and faultless execution, to whom nature appeals in her masterpieces; who assimilate some of the matchless grace they see in a flower, in the turn of a leaf, in the curves that mark the growth of a creeper, in the wing of a bird, the curve of a lizard, or the knots or spirals of a serpent; who can so arrange these forms as to perfectly satisfy the cultivated eye, and keep them subordinated to the containing lines. Such things may be seen in examples of Greek and Tuscan, or rather north Italian, ornament. This sort of ornament, by some mishap, has got christened conventional—a term which has no meaning as applied to ornament; it should rather be called abstracted. Color is another species of ornament that, like form, has doubtless its laws, though as yet neither has been discovered; and we call form and color, like medicine, empirical arts.

We observe that the collocation of certain spaces, or masses of certain colors, give us more pleasure than others, and we try and recollect these collocations if we deal in color, and use them when we have occasion. It has been observed that the primaries that are complementary—*i. e.*, whose mixture produces white—go well together, and that certain secondaries and tertiaries set off primary colors. Chevreul found that the saturation of the eye with a color caused it to see the complementary color if a white surface was looked on; and Chevreul also found out that, if we looked at another color, it was modified by the complementary color of the first. In choosing color we should be careful to have such a tone as we can live with; for most people have their dislikes and preferences. The color of a lady's boudoir is mostly chosen because it sets off her complexion. In a room where we work we are soon conscious of an objectionable color which irritates instead of soothing us. Certain colors and certain tones are beneficial or prejudicial to health. Very dark rooms are prejudicial, and red or yellow will also have a prejudicial effect on our health if we have to remain in rooms of either color all day and every day. A manufacturer had a woman's workshop painted yellow, and found

much more than the usual sickness among his hands. His doctor recommended whitewash, and the normal health was restored. Growers of hyacinths have noticed a marked effect on their blooming when they are put in glasses of certain colors.

Foul and poisonous air has scarcely any connection with decoration, but, with one or two exceptions, is in relation with pure science and its applications. The exceptions are when some of the materials used for decoration have a pernicious chemical action on the air, or parts of their substance readily come off and poison us when we breathe, or when in contact with our skin. The former is said to be the case when preparations of arsenic and some other dyes and pigments are used, and are not varnished. The dust that is not septic consists of minute particles of raw or cooked earth, stone and metal, and the ill effect it may produce can only be from irritation of the mucous surfaces, by clogging fine vessels, or by getting into parts where it is not wanted. Particles of some metals, if numerous enough, may poison us, as fireguilders are poisoned by mercurial fumes. The septic dust consists of particles of vegetable or animal fiber, sometimes laden with the germs of disease, the pollen of flowers, by some of which hay fever is said to be produced, the eggs of microscopic creatures, and microscopic creatures themselves. Another source of poisoning is by animal and human exhalations. Anything that forms a dust-trap is, as far as possible, to be avoided, particularly when these traps can only be partially emptied at long intervals; for every breath of air dislodges some of the lighter particles. The absorbents of the foul-smelling exhalations have also the property of imparting them to damp air, by which we are poisoned or repoisoned. Consequently we want to avoid as much as possible all woven and felted stuffs in our houses, and to have all wood and paper protected by varnish.

SELECTION OF BUILDING MATERIALS.

In preparing plans for a new structure, the most important matter to decide upon is the selection of the material. This, to a large extent, is determined by its cost, but not to so great an extent as might at first be imagined. It is to be taken for granted that an architect will build his structure of the best material his cost limit will permit. Now, this does not mean always the costliest material, although the public are apt to think so; but if the designer be a man of fine taste and well trained in his art, he will select a material that, while essentially durable, will confessedly subserve the best effect. Effect is a prime cause with every architect who has a genuine love for his art, and to a large extent is the dominant feeling in his design; but he still has a wholesome respect for a material that is admittedly substantial and durable.

If the new structure is a public building, he will naturally choose stone in preference to brick for his external walls, because with stone he can obtain a more noble and dignified effect. With stone, too, he can obtain a much more beautiful and permanent color scheme, and, if the structure will admit of decoration, he can obtain, more closely, a better interpretation of his designs than is now possible in brick or terra cotta. Public buildings demand dignity and repose and simplicity of coloring; and stone, as a material, offers the medium of expression. As to stone itself, great care and considerable knowledge of its structure is required to enable the architect to make a proper selection.

Considerations governing the choice of material exists naturally in the purpose of the proposed structure, its geographical location and its situation with respect to adjoining or contiguous structures. In addition to these, a further condition is imposed on its selection by a circumstance which we have reason to believe is seldom thought of, namely, the character of the coal burned in its immediate vicinity. In a district where soft coal is used largely for manufacturing purposes, it is impossible to use a coarse, white stone, such as granite, marble or limestone, because soot becomes deposited on its roughened faces, and darkens and ultimately blackens the entire stonework to such an extent as to destroy its original expression. Where the use of soft coal prevails so as to become detrimental to the beauty of stonework, it is necessary to resort to brick and terra cotta work, because they are not injured so readily as stonework. Where granite is to be used, it is advisable to employ it in such a manner that it will not be damaged by fire from other buildings. This can be done only by strict isolation, and would regulate granite to isolated public buildings. For office buildings, built close to adjoining structures, it is evidently quite unsuitable. Granite-faced structures are often built of one uniform tone as to color, and the effect is cold and harsh. This practice has prevailed in the past, but it is gratifying at the present time to observe a marked change in this regard. Dark-colored granites are now used for lower stories, upon which are imposed stories lighter in color as the crowning cornice is approached. This choice is in keeping both with the proper expression of stability and of aerial perspective.

Where brick is chosen for the sake of its inviting field as to color, it is necessary to use the utmost care in selecting not only materials, but color. Brickmakers, with good judgment and taste, owing, we believe, to the urgent demands of architects and their clients, have been making marked innovations not only in the color of brick, but in their forms. Brick 12 inches long, 1½ to 1¼ inch face, are now made. Other irregular sizes are obtainable, and, in addition to this, rock-faced stonework has been imitated by rough-faced brick. This rough face is a molded face, and when used in a climate or locality free from soft-coal smoke, it can be used to a great advantage. It is a mistake, however, to suppose that artistic brickwork is cheaper than desirable stonework. The choice of either at the same cost is dependent, to a large extent, on the capability of the designer. Some men have a positive talent for designing brickwork which will be exquisite in its refinement of line and delicate glow of color. In every case permanent effect is the ultimate aim, and can be obtained only by an almost array of encyclopedic information which has been carefully classified and fully studied.—*Carpenter and Joiner.*

ADVICE TO YOUNG PLUMBERS.

The following address was delivered by J. W. Hughes to the plumbing class at the Montreal School of Arts, and can be read with profit in this country by the large class of young men and students in the plumbing business:

As I am sure your instructors have given you all the information necessary in the practical departments of the different trades you are learning, I will confine myself in the few words I am about to say to you in giving you some practical hints based upon my actual experience, on such points as will help you to be successful workmen, independent of your knowledge and skill with the tools. This may seem a funny statement to make, as I know it is the common idea that once a man knows his trade that is all that is necessary, from that point of view, to make him a successful man. Now, my experience is that something more is wanted; in fact, there are several things more that go to make a good and successful workman, and the first, let me say, is a good character. No matter how well you may be able to draw, model, carve, make joints and lay out your work, unless you have a character at the back of it all, your success will be small. The world is full of skillful workmen who are almost useless, rendered so by the fact that they cannot be depended upon. Many of them drink. Shun liquor as you would a mad dog. Some of them are liars—their word is not to be depended upon, so no one trusts them. Others are idlers; they "loaf" at their work, waste their time, and are in this sense dishonest. A man who robs his employer of the time he pays him for is just as much a thief as if he put his hand into his employer's pocket and took his money. Many workmen take a very loose view of this aspect of the question of honesty; they seem to think they have a right to loaf if the boss's back is turned or the foreman not around. Now this sort of thing is thorough dishonesty; it is just what the thief does who watches his opportunity and steals when his victims are not on their guard.

Think for a moment of the nature of your engagement with your employer. He agrees to give you so much per day for so many hours' work. Now, what would you think of an employer who, taking advantage of his position and your necessities, refused to fulfill his part of the bargain, and when pay day came only gave you part of your wages and made excuses for the rest? You would think him a mean, sneaking thief of the worst possible sort. Now, why should a workman who does exactly the same thing not rank the same? Think this part of the question over, boys, and serve faithfully, give full time for full pay, and if your wages do not suit you come forward in a manly, straightforward

way and state your case. It is a business transaction between man and man, is this question of work for pay, and should be met in a straightforward business way. Every one likes to sell his goods in the highest market, and it is his right and privilege to do so. But work, as well as material, has its market value, and that is the most the buyer will give, and it is the same whether you are selling and buying boots and shoes, or bread and butter or skilled labor. Be truthful. Let your word be as good as your bond. I have men working for me whose word I would no more doubt then I would the word of the archbishop. Others, again, are shaky, or only tell half the truth, or conceal part of the facts. Come straight out every time; you will then be able to respect yourself and will win the respect of your employer and every one with whom you come in contact.

Be thoughtful in your business. A great painter was once asked with what he mixed his colors to get such good effects. His reply was "brains." Now, unless you put your brains to work and do something, you will never amount to much, and will always have to go to your boss or foreman or shopmate to help you out. Think, think, reason—try and get to the bottom of things by the use of your own head; don't be content to be a mere machine. Why are some men more skillful than others; is it because they have better hands and muscles than others? Not at all. Your hands and eyes and ears and all your functions are merely servants of your brains; your hands do what your head tells them; they are the servants of your brain and will and reason.

Last, but not least, cultivate a good address; be gentlemen in every way, soft spoken, polite and clean. I know it is impossible to work at dirty work and not get dirty, but soap and water are cheap, so are a set of overalls. No need of a mechanic going to and from his work looking like a coal heaver. Have a set of overalls and wear them. Three dollars' worth of overalls will save $25 dollars worth of clothes in a year and keep you respectable; make you feel as if you were somebody, and make other people think you are somebody, and it pays in every way. Wash your hands and face before leaving the shop. It is very little trouble, costs little, and will make you feel much more manly and better. Have a clean mouth, not only as regards what you put in it, but as to what comes out of it. Don't be a loud, dirty talker or swearer. It is not manly; it is mean, low, degrading. No gentleman does such things, and you are all gentlemen. Be patient, your turn will come. Twenty years from now most of the men in active business will be gone, or too old to be worth much, and there is no one else to take their place but you boys. But you must prepare yourselves. You cannot expect to be leading journeymen, foremen or bosses unless you are qualified to fill the position. The public will not be imposed upon—they find out a man's worth very soon. To this end improve your minds, read good books of all kinds, take the trade papers, keep posted and well up, and when an opportunity for a good position comes, as come in the course of time it must, you will be qualified to fill it, and if the best qualified you will be sure to get it. This is a large and growing country, and there are plenty of opportunities in the future if you will only qualify in skill and character to fill them. Be faithful to your duties. As citizens be good, manly Canadians. This is a glorious country, with everything to be proud of. Be patriotic, stick up for your town and province and country every time and everywhere. It is your country and my country and well worth talking for, working for, and if the necessities ever arise, which God forbid, well worth dying for. See to it that Canada, our country, has some of your time, thought and energy to its building up and future prosperity.

TRAPS AND VENTS.

Pineville, Ky., March 16, 1891.—Editor The Sanitary News: I wish to state from fifteen years of practical experience that I have the first combination trap to find yet that will make as sanitary and as safe a piece of plumbing as a plain strap or barrel, when this trap is properly back-aired. There is not a combination trap in existence that can compare with them. The great trouble with the plumbing business to-day is that we have to contend with a great many so-called plumbers who are a disgrace to the profession. I am sorry to say that this class of plumbers as they call themselves, do all they can to produce some inferior article, that instead of advancing the plumbing trade, it only injures it. All practical and competent plumbers should look to the advancement of the business and not place any stock in combination traps. Let us place our shoulders to the wheel and advance ventilated systems of plumbing. It is a credit to every competent plumber to up-hold ventilation and advance all ideas that may be an honor to it, but do not adopt some thing that you are in any way doubtful of as it only goes to injure the profession. What is of more pleasure to a practical plumber than to do a perfect system of ventilated plumbing and to know it is sanitary in every respect and a credit to him. As I said before I speak from experience and believe in plumbing.

Respectfully yours, Robert E. Putnam.
Mgr. Ky. Plumbing Co.

LAY OF A PEDESTRIAN PLUMBER.

Twice a year, summer and winter,
Comes a plumber and a sprinter,
With his bundle on a splinter—on a splinter, dry and tough;
And he says his name is Duffy, quite a toughy, rather guffy,
But he's jolly, never huffy, and he never takes a bluff.

He has tramped from down-east Sago,
To the city of Chicago,
Clear to Wago, wild and woolly, and all o'er the Lone Star State;
And he knows the plumbing bosses, from their profits and their losses
To the color of their "hosses," in this country, free and great.

"I have worked," says he, "for Payne,
And for Ogden at Fort Wayne,
Swiped big tanks for Smith & Conner, and helped make Ed. Baggot's fame;
I got full on work for Muir, and he threw me in the sewer,
But I'd interviewed a brewer, and I never felt the pain.

"On the coast, helped S. M. Perry
Plumb a one-lunged dispensary,
Then I took the train and ferry and gave Frisco quite a swipe;
Then I rode a train of cattle, but I jumped it at Seattle,
But I quit a booming city, 'cause of working iron pipe.

"Where the Moosetocmaguntic
Pours its waters in the Skuntic,
I lined birch canoes for Indian braves, with heavy six-pound lead;
Did a job for Major Foster, made a jump from there to Glouster,
Where I helped an undertaker line a coffin with sheet-lead.

"I have worked in Kansas City,
At Cross & Hornbrook's palace, pretty;
In the suburbs of this bailiwick I worked for Wirt & Wait.
For the Dohertys, the rushers, I was laid off with some lushers,
Then I worked for James A. Foley in the famous Sunflower State.

"I'm ag'in iron ventilation,
It's ag'in my education;
I'll accept no situation to use any but lead pipe;
For this reason I'm a tourist and a red-hot lead-pipe jurist,
And when I go to heaven, I still hope to wipe and swipe.

Dent Yates, Sanitary Poet.
Kansas City.

HOW TO DO BUSINESS AND IMPROVE IT.

Detroit, March 16, 1891.—Editor The Sanitary News: The essay of Mr. Yates, Kansas City, to my mind is the best I have had the pleasure of reading on the subject in some time, and would only suggest a line of business conduct so well and successfully exemplified by your great merchant prince as well as financial king, Marshall Field: Always pay cash, save your discounts, be honest, give good measure, full and running over, above all do unto others as you would be done by; next, deal direct with owner or architect, do not deal with any carpenter who has the audacity (not brains) to take plumbing work and skin it, alter plans, change materials to suit himself, all for lucre, and when finished turn to you and say, "you did not work to plans and specifications. The owner will not and I cannot pay you." Lastly, always speak well of competitors and remember

that self-praise is a very poor recommendation. Only two animals hiss; a snake and a goose.

Take up and peruse all good journals, books or pamphlets pertaining to the trade or profession; be diligent, painstaking and success is yours according to the number of talents you possess.

Respectfully, EXTEMPORE.

THE COMBINATION TRAP.

Plumbers are entitled to all the good things of this world, even poetry, and the following from our plumber bard will no doubt prove interesting:

Hello, Mr. Man, with your combination traps,
Your anti-syphon vents and other such snaps!
For my part I will run it through the roof,—
My vent properly connected needs no other proof.

For nature cannot be beaten by any art;
If the vent is in proper it will do its part;
There are more ways than the right one we know,
That they're adopted by some I fear it is so.

Back-venting is approved by men not very slow
To use the best of methods and let the others go.
Discussions are open to one and to all,
But a half-way discussion don't go at all.

In regard to the last issue of the NEWS,
I will say Mr. Kelly has very clear views;
He upholds good plumbing and wants it done right,
Which knocks the poor tinker clean out of sight.

You made a good speech as far as it goes,
But its weak points every one well knows.
I have had experience with the traps, and the rest
When run through the roof, I found it the best.

Respectfully, Bro. Plumber, TOM CLARKE.

A FINE PLUMBING JOB.

The following high compliments are paid Mr. James H. O'Neill, of Lincoln, Neb., by the *Evening News* for his work on the Lincoln Hotel:

The fine appointments of the Lincoln are seconded by all the conveniences suggested to the experienced builder. The toilet-rooms of our new hotel are the subject of much favorable comments, and compliments have been showered on Mr. James H. O'Neill, the progressive and enterprising plumber who did the work.

When Mr. O'Neill entered upon the performance of this contract, he resolved to spare no efforts to make the plumbing in the hotel the most perfect job that lay in the power of the much-abused, but indispensable, modern plumber. He has most assuredly succeeded, and it is the invariable remark of travelers that toilet-rooms of the Lincoln surpass those of any hostelry in the West.

A magnificent marble slab, thirty feet long, reaches down the entire length of the first room. This slab is of the finest Italian marble, two inches thick. The basins are of the largest oval, marbleized, and all the trimmings are nickel-plated. The slab is open, and supported by heavy marble brackets.

In the adjoining room are the urinals and water closets. The stall partitions and backs are of white marble. And the closet tanks are enclosed in marble. The supports and trimmings are of polished brass, and nickle plated. There are in the building forty-four improved washout closets. The system of ventilation is so perfect that the air in the closet stalls is as pure and sweet as in the rotunda itself.

There are in the building thirty bath rooms, fitted up complete with enameled iron, porcelain lined tubs, with rolled edges, and basins all fitted out with hot and cold water, and water closets of the latest improved pattern. The work in the kitchen and laundry is complete and perfect.

So careful has damage been guarded against that a leak in any fixture, in any part of the house, would be detected in the basement. The gas fitting and gas fixtures, and electrollers were also furnished by Mr. O'Neill.

The job is a credit to our city, and Mr. O'Neill's well earned reputation has been justly increased by it.

PLUMBING NOTES.

A paper on house drainage was recently read before the Liverpool Architectural Society by Mr. T. H. Harrison, F.R.I.B.A. Mr. Harrison said that this was a vitally important subject, and he used the word "vitally" advisedly, for clean air, earth, and water were absolutely necessary to health. The medical profession had only of late years become fully alive to the importance of the subject, and then, although their interests might be said to lie in an opposite direction, they became pioneers in sanitary matters; how much more, therefore, did it behove architects to pay the greatest attention to the subject? He proceeded to demonstrate by means of a glass receiver and siphon the action which takes place when the sewers or other receptacles for sewage are not ventilated, the gases being forced through the traps by the displacement caused by the inrush of sewage, or by the expansion of the gases themselves.

In the olden time when the harvests were plentiful men tore down and built greater in order to provide shelter for the increase. Ever since apartments have been enlarged to provide the necessities of increased prosperity. This is exemplified by the L. Wolff Manufacturing Company, the large and well-known manufacturers of plumbing goods in this city. This company has purchased the building and leased the ground at 91 Dearborn street for a term of ninty-nine years. The purchase and lease was made of the Arthur Reeves estate, the price paid being $30,000, and the terms of the lease, $5,000 a year for the first seven years and $6,000 a year for the remaining period. The new owners will take possession May 1st, and the property will be greatly improved by additional stories to the building and a reconstruction of the interior, making it a handsome, thoroughly modern building. A new front will be constructed making the entrance on the street level. Elevators will be added and a heating and lighting plant put in. The firm will occupy the first and second stories which will be elaborately and handsomely finished and adopted for offices and for the exhibition of their immense stock of fine plumbing appliances and general manufactures.

It will be observed that the subject of quality in plumbing material has been suggested for discussion in THE SANITARY NEWS. This is a subject of interest not only to the manufacturer, the plumber and consumer, but is of importance in the matter of public health. The consumer should be taught the value of good material and should demand and be willing to pay for the same as a matter of economy and healthfulness.

At a recent meeting of the London Registration Committee, acting in conjunction with the Worshipful Company of Plumbers, W. H. Bishop, Master of the Company, congratulated the committee on the fact that the number of plumbers registered during the past year showed a considerable increase over the numbers for previous years. As evidence of the efficiency of their work, he mentioned that during the whole time the committee had been in existence, not a single authenticated case of wrong-doing on the part of a registered plumber had been brought before the court. The number of members of the Metropolitan Committee was not large, but there were upwards of eight hundred members in the various registration committees acting in conjuction with the Company throughout the country.

In the bright lexicon of plumbing there is no such word as "Jerry".

Good plumbing adds about the same value to a dwelling as good health does to an individual.

In having plumbing work done it is to the advantage of the builder to procure the best, not only because it is the best, but because it will prove the cheapest.

Crowding together of humanity into cities makes water works and sewerage necessities, and water works and sewerage make plumbing a necessity, and good plumbing makes doctors—a less necessity than they would be without it.

The man who has secured good plumbing in his house can rest in the security of his healthful home without the harrassment of ever looking about for defects through which may pour all the evils of bad drainage, and this is worth something, to say nothing of the cost of repairs, remodeling, tearing up and replacing and possibly broken health and doctor bills.

At a recent meeting of the Master Plumbers at Manchester the following resolution was adopted: "That in the opinion of this meeting it is of great importance to the interests of the public health that plumbers' work should be entrusted to qnalified craftsmen only, and that in order to secure this it is essential that plumbers be required to give evidence of their qualification. This meeting, therefore, is in favor of legislation constituting a recognized register of plumbers, and regulating admission thereto."

F. E. Cudell, the manufacturer of the Cudell trap and other plumbing specialties, has removed his office from 204 Superior street, Cleveland, to West Cleveland, Ohio.

The master plumbers of Texas will hold a state convention next May at San Antonio. The Texas plumbers have taken hold of the association with a vim and enthusiasm that means success. They have swelled the membership of the National Association and have formed many local associations all of which we believe are members of the National Association.

The journeymen plumbers of Philadelphia have organized an association for the advancement and protection of the interests of their trade, and have applied for a charter.

After the first of next month eight hours will constitute a day's work for the journeymen plumbers of Milwaukee, Wis.

William Vandermann the enterprising plumber and well-known inventor, of Willimantic, Conn., has added to the list of his inventions a fine milling machine, costing $400. Mr. Vandermann has produced many valuable inventions in the plumbing line which are the results of his practical experience in the trade.

The bill for practical plumbers for inspectors of plumbing in Elmira, N. Y., has passed the Legislature at Albany.

The Omaha plumbers feel confident that they will soon have a model plumbing ordinance. They have been working in this direction faithfully, and the council is very likely to reward their efforts by passing the ordinance designed by the plumbers.

The Master Plumbers' Steam and Gasfitters' Association of Lynn, Mass., is urging the council to adopt suitable ordinances regulating plumbing and providing for an inspector in that city.

Dr. Tourneux has submitted to the Health Department of San Francisco, Cal., an amended plumbing ordinance, requiring plumbers to pass satisfactory examinations and register their names at the Department, and requiring also a compliance with the regulations of the board. The master and journeymen plumbers have also prepared and submitted plumbing rules and regulations and all will be submitted for consideration by the board of supervisors.

Some time ago President Griffith requested of Master Plumbers' local associations information regarding their officers and members. He has not received this information from all, and, as another annual convention is approaching, we would suggest the importance of promptness in this matter. President Griffith has been active in the discharge of his official duties, wide-awake, enthusiastic, able, and has given the cause efficient and effective services. He has materially advanced the interests of the association and has added several new local associations thereto.

The Sanitary Plumber kindly corrects The Sanitary News in regard to the amount paid the journeymen plumbers in New York, the wages being 43¾ cents per hour, eight hours constituting a days work.

We are under obligations to some one for the receipt of a handsome copy of the Hand-Book of the Master Plumbers' Association of Philadelphia, 1891. The book is a work of art, and contains much useful matter—such as officers and committees of the association, charter, constitution and by-laws, members of the association; constitution and by-laws of the National Association of Master Plumbers, its officers and committees; rules and regulations governing house-drainage and ventilation in Philadelphia; schedule of water-rates and charges, etc.—making it a very useful and convenient article to have around, as well as an ornament to a desk.

Every citizen in Chicago should heartily endorse the ordinance regarding the appointment of plumbers for plumbing inspection, and the increase of inspectors. Chicago has grown until this demand is a necessity, and its relation to health makes it the most important matter with which the city has to deal.

THE VIRUS CURE.

First they pumped him full of virus from some mediocre cow,
Lest the small-pox might assail him and leave pitmarks on his brow;
Then one day a bulldog bit him—he was gunning down at Quogue—
And they filled his veins in Paris with an extract of mad dog;
Then he caught tuberculosis, so they took him to Berlin,
And injected half a gallon of bacillæ into him;
Well, his friends were all delighted with the quickness of the cure,
Till he caught the typhoid fever, and speedy death was sure;
Then the doctors with some sewage did inoculate a hen,
And injected half its gastric juice into his abdomen;
But as soon as he recovered, as of course he had to do,
There came along a rattlesnake and bit his thumb in two;
Once again his veins were opened to receive about a gill
Of some serpentine solution with the venom in it still;
To prepare him for a voyage in an Asiatic sea,
New blood was pumped into him from a lep'rous old Chinee;
Soon his appetite had vanished and he could not eat at all,
So the virus of dyspepsia was injected in the fall;
But his blood was so diluted with the remedies he'd taken
That one day he laid him down and died and never did awaken;
With the Brown-Sequard elixir though they tried resuscitation,
He never showed a symptom of reviving animation;
Yet his doctor still could save him (he persistently maintains)
If he only could inject a little life into his veins.

—*E. Frank Lintaber, in Puck.*

HEALTH IN SUNSHINE.

Alexander the Great once went to Diogenes as he was reposing in his tub, and asked him what he could do for him. Diogenes replied, "Stand out of my sunshine." The conqueror of the world, offering the choice of gifts to a man who had not even a roof to cover his head, and yet who chose nothing but the sunshine, which was his already! Considered from a hygienic point of view, the story contains a striking moral.

"One of the great mistakes of the winter season," says Dr. Hamilton Osgood, "is indifference to sunshine when it is possible to live and sleep in sunny rooms. Such indifference is attended with serious danger. In the choice of apartments, anything and everything within reason ought to be sacrificed to the necessity of having the living and sleeping rooms where they can every day be purified by the sun. Instead of having the guest-chamber and the parlor in the sun, they should be given the shady side of the house; for, in comparison to the family rooms, they are but little used.

"In the health of women, children and invalids, who, during the cold months, spend so much time indoors, it makes a vast difference as to whether the rooms in which they live are in sunshine or in shadow. Look at the faces of miners, of clerks who are immured in dark offices, of women and children who hardly see the sun in the winter. How faded, colorless and unhealthy they are, in comparison with the faces of those who will have sunshine indoors and out!"

A New York merchant noticed, in the course of years, that each successive book-keeper gradually lost his health, and finally died of consumption, however vigorous and robust he was on entering his service. At length it occurred to him that the little rear room, where the books were kept, opened into a back yard so surrounded by high walls that no sunshine came into it from one year's end to another. An upper room, well lighted, was immediately prepared, and his clerks had uniform good health ever after.—*Good Health.*

THE WIDTH OF STREETS AND PUBLIC HEALTH.

The London *Lancet* says: According to an American contemporary, Dr. Anders has been making certain inquiries in Philadelphia as to the influence of the width of streets on the mortality from phthisis, and as the results of examining into the localization of 1,500 deaths, he has arrived at the conclusion that the number

of phthisis deaths is smaller in proportion to the population in wide streets than in narrow ones, and that in narrow streets the mortality is greatest where they are long, or where they form culs-de sac; in other words, complete movement of air about dwellings is a point of great importance in connection with the question of pulmonary phthisis. It is on this principle that all modern by-laws as to open space about houses are based, and it is as important to have wide-open spaces behind houses as well as in the streets in front, so as to secure a proper through current of air. There is, as a rule, not much difficulty in getting a reasonable width of street in the case of newly laid-out areas for building; but there is a constant tendency to put an undue limit on the needed area behind dwelling-houses, although this is a matter of the first importance as regards the promotion of health and the prevention of a certain class of diseases. The observations from Philadelphia deserve the consideration of such sanitary authorities in this country as have not yet acquired proper control over the open spaces to be provided about new domestic buildings.

TRADE AND BUSINESS NOTES.

A finely illustrated 200 page catalogue of blowers, heating and drying apparatus, portable forges, engines, &c., has just been published by the B. F. Sturtevant Co., Boston, Mass.

It is devoted principally to the general line of goods and method of introduction, as special catalogues are published, relating to the different departments of work. The value of the catalogue to engineers is well voiced in the "Introductory" from which we quote:

The first comprehensive and authentic tables and diagrams relating to the action of air under pressure, and to the speeds, pressures, capacities and powers required upon all classes of blowers were published in our catalogues of 1870 and 1873.

The information and tables therein contained have formed the basis of all computations of the movement of air by fans, and has been extensively copied, but not originated by other manufacturers. The constant demand by engineers for these tables led to their careful revision and the introduction of much new material, and they are here presented as the only authentic data relating to fan blowers.

The catalogue bears marked evidence of the prosperity of this firm, and of its thorough acquaintance with the branch of engineering which it represents.

Our readers who are afflicted with deafness should not fail to write to Dr. A. Fontaine, No. 34 West 14th street, New York city, for his circulars giving affidavits and testimonials of wonderful cures from prominent people. The doctor is an aurist of world-wide reputation. See his advertisement elsewhere.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Thomas Eckhardt will build on Hampden place a three-story and basement apartment house, 50x75 feet, Portage brown stone front, to have hardwood interior finish, all the improvements, and cost $30,000. Architects, J. M. Van Osdel & Co. F. K. Baumann and J. C. Cady have made plans and let contracts for a six-story cold-storage warehouse, 50x100 feet, on Michigan street, just east of State. It will have a pressed brick and stone front, the second floor to be of fire-proof construction and the remainder of mill construction. Henry Ives Cobb is preparing plans for a sixteen-story office building, to be erected on the north side of Washington street, between Dearborn and Clark, by the Cook County Abstract Co. The estimated cost is $800,000. The same architect is planning a five or six-story addition to the Union Club, to be erected on the west side of the present building at Washington place and Dearborn avenue. It will be constructed of brick and the interior will be elaborately finished; cost, $50,000. Clinton J. Warren is preparing plans for a ten-story hotel, to be erected at the northeast corner of Michigan avenue and Twenty-second street, by E. A. Batcheldor and General Milo S. Hascall. It will be of modern construction, of stone and brick; cost, $500,000. S. S. Beman is planning a thirteen-story office building, to be erected in Milwaukee, at the corner of Water and Wisconsin streets, by Capt. Pabst, of the Pabst Brewing Co.; cost, $350,000. Burnham & Root are planning an eight-story office building to be erected in Cleveland, by Col. John Hay and others. It will be of stone construction and thoroughly fire-proof; cost, $500,000. O. J. Pierce is planning a two-story and basement residence for Col. Walworth, to be erected in Evanston; pressed brick and stone construction; cost, $20,000. He has also planned ten dwellings to be erected on Ullman street between Thirty-seventh and Thirty-eighth streets by the Robins estate; cost, $14,000. Gregory Vigeant has planned a five-story and basement store building, to be built at 177 Illinois street, by William Spain; brick and stone construction; cost, $25,000. He has also planned a Catholic church, to be erected at Marinette, Wis., and is taking bids on a two-story and basement dwelling for himself. E. H. Turnock has planned a three-story and basement flat building for Charles Matthews, to be built on Twenty-ninth street; brick and stone construction; cost, $10,000. Also a flat building for F. Berhmon, to be erected at 115 Lytle street; cost, $7,500. Louis Martens is planning four three-story dwellings, to be built on Ellis avenue near Thirty-sixth street, by Hopkins & McKillup. They will be constructed of stone and will cost $30,000. A four-story flat building for Henry Towne, to be built on Wood near Indiana street; cost, $12,500; also a three-story flat bullding for M. Hess, to be built on Ashland boulevard south of Polk street; cost, $12,500; also a four-story and flat building for George Axel, to be built on Wells street near Chicago avenue; cost, $15,500. J. L. Silsbee has planned a two-story and basement residence for Rollin A. Keyes, to be erected at Kenilworth, to be of frame and bowlder stone; cost, $15,000. William Strippleman has planned a two-story and cellar residence for Michael Clarkson, to be built at Forty-ninth street and Michigan boulevard. It will be constructed of Bedford stone with an elaborately finished hard wood interior; cost, $25,000; also for the same person a two-story and cellar flat building, to be erected adjoining his residence; cost, $14,000; also a three-story and basement flat building for C. F. Gavitt, to be erected at the corner of West Madison street and California avenue; cost, $16,000; also an additional story to the Fulton Market on Fulton street between Peoria and Green street, for the Fulton Market Co.; cost, $15,000. He is also preparing plans for the Theatre Musee for Kohl & Middleton; cost, $40,000. Furst & Rudolph are planning a three-story flat building for M. Goldstein, to be erected on Fourth avenue near Polk street; cost, $12,000. August Fielder has planned a three-story and cellar store and flat building for George Schmidt, to be built at 365–369 Webster avenue; cost, $18,000. Ostling Bros. have designed alterations and a new front for Spelz's Hall, corner of North Halsted and Clark streets; cost, $9,000; also a flat building for P. L. Peterson, to be built at 488 Wells street; cost, $12,000.——Philadelphia, Pa.: Architect S. D. Button has prepared drawings for a spacious hotel to be erected at Mount Holly, N. J. George Watson & Son have been awarded the contract for the erection of St. Elizabeth's Home at Andalusia, which will be built by Miss Katharine Drexel after plans prepared by Architect Charles M. Burns. The drawings for the new police station to be built at Twenty-third and Berks streets are now being prepared by W. B. Powell, the architect. A Presbyterian church will be built at Wayne, Delaware county, after plans drawn by John Frazer & Son, of Philadelphia. William Struthers will build a residence along the line of the Pennsylvania R. R. from plans prepared by Lindley Johnson. Three dwellings will be built on the west side of Edgemont street, north of Anthracite, by John H. McLaughlin. On the west side of Newkirk street, north of Lehigh avenue, four houses will be built by J. H. Gordon. Sixty houses will be built by Clarence M. Busch, the builder. Twenty dwellings will be built on the north side of Herman street, west of Thirty-first, by W. F. Albrecht. At Fortieth and Popular streets thirteen dwellings will be erected by William C. Merritt. Two blocks of large houses will be erected on Chester avenue from Forty-ninth to Fifty-first streets, by W. S. P. Shields, the builder, who will also build rows of small dwellings on Fiftieth and Fifty-first streets. The congregation of the Lutheran church at Quakertown will soon erect a new edifice. A row of houses will be built on Pechin street near Morton by William Rayner. The drawings for the parochial bullding to be attached to the Holy Trinity Protestant Episcopal church at Nineteenth and Walnut streets, have been prepared by Architects G. W. & W. D. Hewitt; the building

will be four stories high, of brick and stone. Architect George T. Pearson has prepared drawings for a new wing to be built to a hotel at Roanoke, Va. The drawings for the new Western church have been completed by Thomas P. Lonsdale, but as yet no site has been finally accepted for the edifice. Nos. 1306, 1308 and 1310 Filbert street have been purchased by Dunlap & Clark, who propose erecting a seven-story office building upon the site at a cost of about $60,000. Twelve houses will be built on the east side of Frankford avenue south of Ann street by C. C. Moore. On the west side of America street south of Chew two large houses will be built by William Cowle. Jacob E. Ridgway will build sixty-two dwellings on Marston street north of Montgomery avenue. Thirteen houses will be built by William C. Merritt; six will front on the north side of Popular street east of Fortieth, and seven on the south side of Eaglesfield street west of Fortieth. Nine houses will be erected on the west side of Potter street south of Clearfield by John Meighan.——Brooklyn, N. Y.: Tenth street, south side, 125 feet east of Berry street, four three-story frame dwellings, 18x 18; total cost, $14,000; owner, M. English. Hamburg avenue, east side, 20 feet south of Woodbine street, eight two-story frame dwellings, 18x45; cost each, $2,200; owners and architects, Francisco Bros. Putnam avenue, north side, 95 feet east of Stuyvesant avenue, seven two and one-half-story and basement brick dwellings, 18x100 feet; cost each, $5,000; owner, Charles Herr. Grand avenue and Park place, northeast corner, one three-story brick station and patrol stable, 81x105; cost, $35,775; owner, City of Brooklyn. Macon street, north side, 175 feet west of Lewis street, three two and one-half-story and basement brick dwellings, 20x 100 feet; total cost, $15,000; owner, F. B. Norris. Carroll street, south side, 118 feet west of Henry street, two three-story brick dwellings, 36x18; total cost, $7,200; owner, John Weldon. Fourteenth street, north side, 217 feet east of Eighth avenue, five two-story and basement brick dwellings, 20x100; total cost, $19,000; owner, Mrs. G. F. Beatty.——Pittsburg, Pa.: Architect F. C. Sauer has prepared the following plans: For Thos. J. McClurg, frame dwelling on Carson street near Thirty-third street, south side. James W. Gerrard has the contract. For Mrs. Mary Bovard, of Washington, D. C., frame dwelling on Sydenham street, Hazelwood. B. K. Waughter has the contract. For Oswald Werner, a stone residence on North Hiland avenue, East End. The school directors of the Twenty-third ward will build an addition to the Greenfield avenue school. Architect E. E. Miller has plans for two frame residences to be erected on Chestnut street, Sewickley; cost, about $5,000 each. Architect Wm. M. McBride has plans for a building of brick and stone for Isaac Wertheimer, to be erected on the north side of Fayette street, below Frazer, Allegheny. Cochran & Davis have the contract. ——Washington, D. C.: Builder Chas. Gessford will erect a block of eight dwellings at Ninth and C streets, northeast. They will be two stories and basement, base of Hummelstown brownstone, which will also be used to trim the upper front of press brick; cost, $42,000. Architect C. A. Didden has plans for three dwellings that A. Eberly will have built on the north side of K street, between Sixth and Seventh streets, northwest. They will be three stories and cellar, 20x63, with fronts of press brick and Hummelstown brownstone; cost, $14,000.——Detroit, Mich.: A. C. Varney & Co. have prepared plans for a block of four dwellings, three stories high, for Bernard Wilds, corner of Joseph Campan avenue and Congress streets, to cost $14,000. Thomas Zoltowski will build a two-story brick brewery on Hastings street, between Alexandrine and Willis avenues, to cost $10,000. Malcomson & Higginbotham will take charge of the rebuilding of the Central Church of Christ, recently destroyed by fire. The same architects are preparing plans for a saloon for Lennane Bros. on north side of Cadillac square, the estimated cost of the improvements being $10,000. They are also preparing plans for a three-story brick residence for Wm. A. Prings, to be built on the west side of Park street. It will be trimmed with cut stone and ornamental brick, and the interior finished throughout in hard woods. It will cost $6,500. Hess & Raseman have prepared plans for the remodeling of a three-story brick building on the north side of Congress street for the Detroit Gas Light Co. The building will be extended to the front line of the lot, a new front built of Findlay pressed brick, trimmed with cut stone and otherwise improved, at an estimated expenditure of $10,000.

HEATING AND LIGHTING.

Grand Haven, Mich.: Improvements are to be made to the local gas-works.——Abilene. Tex.: This place is to have an electric light plant at an early day.——Concord, N. H.: An electric light plant is to be established by the People's Light, Heat and Power Co.——Moberly, Mo.: The Moberly Gas and Electric Co., capital $30,000, has filed articles of incorporation. The stockholders are L. M. Rumsey, James Green, and others.——Rome, N. Y.: The Gansevoort Electric Light Co. has been granted a franchise for incandescent lighting in this city.——Newberry, N. C.: It is probable that an electric light plant will be established.——Reynoldsville, Pa.: The Bell, Lewis & Yates Co. will put in an electric plant at the collieries, for the purpose of lighting its mines.——Vicksburg, Miss.: Important extensions are to be made to the plant of the Hill City Electric Light Co.——Hookset, N. H.: The Merrimac Heat, Light and Power Co. has been incorporated.——Muncie, Ind.: The Delaware Light and Fuel Co. has been incorporated, with a capital of $100,000. Messrs. C. W. Neely, J. V. Gilbert, and others, are incorporators.——Medina, N. Y.: The Medina Electric Co. has been incorporated, with a capital stock of $20,000, to manufacture and distribute electricity for light, heat and power. Incorporators, C. T. Moffett, H. C. Hodgins, and others.——South Newmarket, N. H.: The South Newmarket Electric Light and Power Co. has been incorporated.——Cumberland, Md.: The local electric light plant is to be improved.——Paterson, N. J.: Reports say that the mains of the Paterson Gaslight Co. are to be extended to the village of Totowa.——Greensburg, Pa.: The Claridge Gas-Coal Co. has been incorporated, with a capital of $100,000. The directors are Thomas Donohoe, Ezra M. Gross, and others.——Brownwood, Tex.: The erection of an electric light plant is talked of.——Sumter, S. C.: The erection of an electric light plant is being discussed.—— Manchester, Va.: City Engineer Cutshaw is preparing plans and estimates for an electric light plant.——Vacaville, Cal.: A project is on foot to supply the town with electric lights, and is meeting with hearty support on the part of business men and others.—— Monterey, Cal.: The Monterey Electric Light and Development Co., capital stock $250,000, has been incorporated by Edward Ingram, S. H. Smith, David R. Dodwick, E. M. Carver and F. R. Day.

SEWERAGE NOTES.

Weehawken, N. J.: Steps are being taken for the establishment of a sewerage system.——Avondale, O.: The sewerage commission has adopted a plan for constructing sewers in the eastern portion of the city.——Anderson, Ind.: The city proposes to build a sewerage system during the coming spring and summer, to cost $75,000.——Dayton, O.: A bill is before the Legislature authorizing the city to issue bonds to the amount of $35,000, to complete the East End sewer.——Lynn, Mass.: The Legislature is asked for authority to establish a drainage commission.——Buffalo, N.Y.: The Board of Health has recommended the construction of additional sewers.——Springfield, Mass.: The city wants authority to spend $75,000 for sewerage.——Orange, N. J.: An ordinance providing for the proposed system of sewerage has been introduced into the city council. The work is estimated to cost over $800,000, including the intercepting sewer, which will be eight miles long from the city line to the Passaic river, near Belleville.——Sharpsburg, Pa.: Plans for sewerage have been completed; cost, $75,000.——Knoxville, Tenn.: A bill has passed the Tennessee Legislature authorizing the city to issue the $500,000 of bonds, for sewerage, etc., previously mentioned. An election is to be held in a few months to decide as to the issuance; $250,000 is to be used for sewerage, $125,000 for bridges, and $125,000 for street improvements.——Port Jarvis, N. Y.: The city will vote this spring on the question of sewerage.——Indianapolis, Ind.: The Sewerage Committee submitted its report to the city council, March 10th, and it was referred to the Committee on City Interests for final action. Charles B. Fletcher, chairman of the Sewerage Committee, can furnish particulars.——Montclair, N. J.: The town committee elected is understood to be in favor of taking steps that contemplate the early adoption of a sewerage system.——Springfield, Mo.: Plans for a sewerage system for this place have been prepared by R. F. Hartford, C. E., of Chattanooga. A vote is to be taken on the question of issuing bonds. D. B. Ross is chairman

of the Sewer Committee.——Woonsocket, R. I.: The joint special Committee on Sewers has received a full report, with plans and recommendations, for a system of sewerage, from City Engineer Charles A. Allen, of Worcester, Mass.——Harrisburg, Pa.: At a meeting of the city council, held March 9, numerous sewer extensions were authorized.——St. Paul, Minn.: The city council has passed the final order for the Fisk street sewer system, which, as proposed, will underlie Sixth street, and be three miles long.——Maywood, Ill.: The Board of Trustees will advertise at once for bids for the construction of a system of sewers, comprising some five miles of main and laterals, to be built as soon as possible.——Lexington, Ky.: Considerable sewer work is to be done here. The city surveyor can furnish particulars.——Canaan, Conn.: W. H. Camp, G. P. Strong and H. P. Tracy have been appointed a special committee to investigate the proper methods, cost, etc., for a sewer system.——Chattanooga, Tenn.: Seventy-five thousand dollars' worth of six-per-cent. sewer bonds are to be offered for sale at once. One mile of brick sewer and two miles of pipe sewer, the latter from eight to eighteen inches, will be constructed this season.——Elmira, N. Y.: The sum of $75,000 is to be expended on sewer extensions.——Terre Haute, Ind.: Numerous sewer extensions have been authorized by the city council. Mayor Donaldson can furnish particulars.——Wilkesbarre, Pa.: Additional sewers, to cost $75,000, are to be constructed.

WATER WORKS NOTES.

Nemaha, Neb.: There is some talk of water works.——Peru, Ill.: The city wants to put in water-works, but cannot on account of the state constitution preventing a municipality from incurring indebtedness for any purpose, exceeding five per centum of assessed valuation.——Montrose, N. Y.: Water-works will be built by F. S. Pecke & Co. of Watertown.——Cheboygan, Mich.: There is considerable talk of water-works.——Bridgeport, O.: At the coming spring election Bridgeport, O., will vote on the question of water-works, the works to be built and owned by a company, water to be furnished private cusumers at a stated rate, the town to pay $2,600 per year for seventy-five hydrants.——Bay City, Mich.: The city voted to issue $50,000 bonds for water-works last fall. Now the council has ordered a special election on the question of raising $25,000 more for the same purpose, and if passed the whole $75,000 will be sold at once.——Holland, Mich.: The city will vote on the issuing of $17,000 bonds for water-works improvements.——Cottage City, Mass.: Water-works will be extended.——Zanesville, O.: A new pump and additional mains will be put in.——Ilion, N. Y.: The city will put in a water-works system soon.——Northampton, Mass.: Additional water pipe will be laid.——Mancelona, Mich.: A stock company will construct a complete system of water-works.——Statesville, N. C.: Address A. J. Evans regarding water-works.——Clarence, Ia.: The city has voted in favor of water-works. Tekamah, Neb.: The city has voted to bond itself for $13,000 for water-works.——Pana, Ill.: It is thought that the vote at the coming spring election will be in favor of water-works.——Quincy, Ill.: April 7, the city will vote on the water-works question.——Cheyenne, Wyo.: The water-works system is to be improved during the coming summer season. New pumps and a station will be wanted, and about 20,000 feet of 4, 6, 12 and 14-inch cast-iron pipe will be used. The expenditure, it is calculated, will be about $75,000.——Seattle, Wash.: W. T. Clark, Superintendent of the water-works has made certain recommendations regarding the improvement of the system. The recommendations have been adopted by the Board of Public Works, and the work will probably be done at once.——Dundee, Ill.: The question of establishing a system of water-works is being agitated.——Pueblo, Col.: It is probable that improvements and extensions will soon be made to the local water-works system. Alderman O'Brian can furnish particulars.——Toronto, Ont.: At a meeting of the city council held March 9, a by-law was passed providing the sum of $100,000 for water-works extensions. Alderman Boustead can furnish particulars.——Savannah, Ga.: It is reported that operations on the new water-works system will begin very soon. T. T. Johnson, the consulting engineer, is to take charge of the undertaking, and an appropriation of $60,000 for the work has been made by the city council.——Nelsonville, O.: According to reports the projected water-works system is almost assured.——Hay Springs, Neb.: The contract for water-works has been awarded to the U. S. Wind, Engine and Pump Co, Omaha, Neb.——Portsmouth, O.: The estimated cost of the water-works system proposed is $35,000.——Blacksburg, S. C.: It is reported that important steps will soon be taken in the matter of establishing a system of water-works.——West Medway, Mass.: Reports say that if the town gives permission, a company will be formed to construct a water supply system.——Olney, Ill.: Efforts are being made to establish a water-works system, which it is estimated will cost $15,000.——Hickory, N. C.: Hartford, Herbert & Co., C. E., of Chattanooga, Tenn., have been employed to prepare plans for a water-works system contemplating a million-gallon pumping plant, stand-pipe, four miles of mains and 35 hydrants. Address Mayor Whitener.——Steelton, Pa.: James Gamble, of 68 Wall street, N. Y., and associates, have purchased the charter for water-works, and will at once proceed with construction.

BIDS AND CONTRACTS.

Miller, S. D.: Proposals are wanted till April 3 for the sinking of an artesian well. Address the county clerk for particulars.——Little Rock, Ark.: Proposals are wanted until April 7 for the construction of a foot, highway and street-railroad bridge over the Arkansas river, at this place. Address Hon. Jacob Erb, county judge.——Sonora, Tex.: Proposals for building a stone courthouse for Sutton county, Texas, will be received until March 31, at the office of I. J. Dunagan.——Manchester, Va.: Proposals are wanted for putting in a complete sewerage system. Address Robert Nelson, city engineer.——Toledo, O.: Proposals are wanted until April 2 for furnishing and erecting complete one vertical pumping engine, daily capacity 75,000,000 gallons. Address J. D. Cook, consulting engineer.——Fremont, Ohio: Proposals are wanted until March 30 for the construction of certain sewers. Address W. E. Proctor, of the Committee on improvements.——Washington, D. C.: Separate sealed proposals are wanted at the office of building for Library of Congress, from manufacturers, until 2 P.M. on Thursday, the second day of April, 1891, and opened immediately thereafter in presence of bidders, for furnishing and delivering at the site of the building for Library of Congress, in this city, the following fixtures, fitting, and materials for heating and power apparatus: Class 1—Shell boilers, fronts and trimmings, water-heaters, tanks, etc. Class 2—Cast-iron flange-pipe, hot-water coils, manhole doors, etc. Class 3—Fittings for wrought-iron pipe, valves, steam traps, galvanized sheet-iron pipes, etc. Class 4—Wrought-iron plain and galvanized pipe.——Marion, O.: Proposals are wanted for 4,515.3 lineal feet of fifteen-inch sewers; 8,452.6 lineal feet of eight-inch sewers; 640 lineal feet of six-inch sewers; eleven brick manholes; thirty-four sewer-pipe lamp-holes; nine automatic flush-tanks; under-head of sewers; 4,515.3 lineal feet of ten-inch, butt-joint subsoil drain-tile; 9,092.6 lineal feet of six-inch butt-joint subsoil drain-tile; 1,273 cubic yards of broken stone, packing for subsoil drains—under the head of subsoil drains. There will occur in trenching for above work, 2,169.6 cubic yards of rock excavation (more or less).

America is not only furnishing Europe with nearly all its electric machines, and lighting Paris by electricity, but has recently sold $300,000 worth of dynamos and lamps with which to light up the London station of the Midland Railway of England.

The proprietors of every theater and place of entertainment in Berlin, capable of containing more than 800 persons, have been requested by the police authorities to take measures to have their building lighted by electricity.

It is authoritatively stated that the electrical underground railway in London has proved that a speed of twenty-four miles an hour is practicable. There are bills before the House of Commons from many other British cities for rapid-transit railways on the same plan.

"Caoutchouc Lake," says the *Chemical Review*, is a German preparation by Keyser; he takes one ounce of the best India-rubber, cuts it in small pieces, and lets it steep exposed to sunlight in one quart of light camphor-oil for a few days. It is used for mixing with varnish, for binding colors, etc.

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ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

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THE plumbers' great friends in procuring pure and clean plumbing systems are water and air. Flushing and ventilation hold places in sanitary drainage that cannot be disputed.

THE plumber who builds up a business on honesty, efficiency and reliability, has established a business that is permanent, and one that will continually increase.

THE activity in the plumbing fraternity in presenting ordinances governing plumbing, and urging their adoption, is having a good effect. It not only secures the adoption of plumbing regulations, but educates the people correctly, and places the plumber in a position to do himself justice, and better serve the public. Those people who pretend to think that all plumbing rules are established in the interest of the plumber are growing scarce, and a healthier sentiment regarding plumbing exists.

OBSERVING the interest taken in the subject of traps and venting, as disclosed in the discussion of the matter in THE SANITARY NEWS, we concluded that a description of the several traps now in use, setting forth their merits and claims, would be of much interest and value. Accordingly, the manufacturers or inventors were requested to furnish the NEWS, for publication, a full description illustrating the important features of their traps. This matter was requested for the purpose of giving those interested in plumbing matters a view of these important sanitary fixtures from the inventor's stand-point, in order that attention might be called directly to their claims. The opportunity of thus presenting their claims has been presented to all the manufacturers, so far as we had knowledge of them, and all given an equal chance to discuss the features of their traps. The object was to give all an opportunity, and publish the matter received. This we will do, and will soon begin the publication of the series—ample time being given for all to respond.

"JAMES YORK and George Clafin recently stole the recently-built house of Physician Fenton from his ranch, near Rocky Ford, and moved it on to one of their claims. The men have been arrested."

"The above is a clipping from one of our daily papers. With the enterprise proverbial of the American citizens, would it be possible that a theft take place, in open daylight, of one of our recently-erected seven-story buildings? We have heard of the theft of red-hot stoves, but never given the matter full credence. With the truth of the above clipping fully established, we shall be ready to give the enterprising thief credit for doing almost anything."—*Architect and Contractor.*

So far as hearsay goes, we can beat this. We once heard of a man who stole a mill, but got caught when he went back after the dam.

ALL that is needed in the inspection portion of our Health Department is the ordinance regarding plumbing, plumbing inspectors, and the increase of the number of inspectors. To touch the system in any other respect would be at the risk of impairing its efficiency and usefulness. Give Chief-Inspector Young sufficient inspectors, and he will give us a model city in a sanitary point of view.

POLLUTION OF THE ATMOSPHERE.

Chief-Inspector Young has come nearer than any one else ever came in solving the problem of smoke abatement. In this regard he has given himself and Chicago a reputation that extends beyond the bounds of this country. THE SANITARY NEWS has inquiries from many cities in this country concerning the methods adopted here, and foreign exchanges are quoting the American press regarding the success of Chicago's chief inspector. To abate the smoke nuisance of a great city is no little undertaking, and cannot be done in a day. Enough has been published, and is of record, to show that the vast work already accomplished can be pushed to practical perfection. It has also been demonstrated that such a consummation will repay all labors and expenditures in this direction. The success thus far attained is a marked improvement in the city's atmosphere, which adds directly to the city's beauty, wealth and health.

An English exchange, speaking of this phase of atmospheric pollution, says that the question of air-pollution, in connection with the smoky condition of the atmosphere in large cities, has become a matter of vital interest to all engaged in the sanitary redemption of centers of population. It has been arranged in Great Britain that a systematic series of analysis be carried on at different points at the same time, which would give valuable information as to the chief causes of atmospheric pollution.

The analytical scheme is comprehensive, and gives definite information on the following points: 1. The composition of the air in densely populated as compared with thinly populated districts. 2. The relation between atmospheric impurities and prevalent sickness and mortality. 3. Amount and distribution of noxious ingredients specially injurious to plant life. 4. The extent to which smoke and noxious gases are due to dwellings and factories.

The observations are to be made at seven different stations in Manchester and Salford, the sum required for the necessary apparatus being already secured by public subscription. At a meet-

ing of the society on January 7th, Dr. Bailey reported investigations as having commenced. "They had found," he said, "that snow carried to the ground large quantities of sulphuric and hydrocholic acids, and also some of the elements of sewage. The deposits on leaves were in amount directly as the population, and greatest injury to plant life was due to the emanations from dwelling houses. It was estimated that, in one day, two tons of soot and 300 pounds of sulphuric acid were deposited per square mile of the city area." These figures show that much valuable informa tion may be expected in the final report. A committee working on similar lines has been appointed in London, and it is but a question of time when scientific investigation will reveal the sanitary sins of our chimneys, and place the smoke nuisance on the calendar of crimes. That has been done in this city, and in some others in this country. In others, ordinances are being prepared and passed, making the smoke nuisance a penal offense, and measures are being put forward to abate it. The wholesome effect of concerted action in this great reform cannot be estimated. It will result in the enhancement of the beauty of our cities, the increase of their material wealth, the increase of values, a less death-rate, and a smaller per cent. of loss caused by the waste of disease and low scale of physical activity. The natural instincts of cleanliness and morality should demand the highest possible attainment in the purification of the atmosphere, which is such an important factor in the economy of health and the virtues of right living.

FIFTY YEARS OF SANITARY PROGRESS.

The *Edinbuagh Review* contains a very interesting article on the "Sanitary Progress of the Last Fifty Years." The picture presented a little more than a quarter of a century ago is not a beautiful one, and shows room for much progress, which has been made. From the report of the Royal Commission, 1844–5, it is shown that out of fifty towns visited on behalf of the commissioners, the drainage was reported as bad in forty-three, the cleansing in forty-two, the water-supply in thirty-two. In Liverpool 40,000, and in Manchester 15,000 of the working class lived in cellars, "dark, damp, dirty and ill-ventilated." The results of this state of things were clearly seen. Whilst the death-rate in country districts was 18.2 per thousand, in towns it was 26.2, in Birmingham and Leeds it was 27.2, in Bristol 30.9, in Manchester 33.7, in Liverpool 34 8. The average age at death in Rutland and in Wiltshire was 36½ years, whilst in Leeds it was 21, in Manchester 20, in Liverpool 17.

The sanitary period began in 1838, after which our history falls into three main periods. There is, first of all, from 1838 to 1854, a time of great and, on the part of the general public, somewhat blind activity, when a sense of evils rather than a knowledge of possible remedies dictated public action. From 1854 to 1866 there follows a time of apparent stagnation, but perhaps of greater and more lasting growth. With 1866 begins a great outburst of legislative activity, stimulated by the report of the Royal Sanitary Commission in 1871, which has lasted to the present time, and has, to some extent at least, affected administration.

From that day, progress has been marked, although not at all times regular, and the following figures are of much interest: If all men lived their full span of eighty years, the death-rate would be 12.5 per thousand. In Surrey, outside London, the actual death-rate was brought down to 14.3. The death-rate in 1839 in England was 22.4, but it has never fallen below 21. In the ten years from 1871–80, the children born in any one of these years had 1,800,000 years more of expectation of life than they would have had if they had been born between 1838–54. Notwithstanding all our sanitary progress, the chance of a man reaching three-score years and ten is smaller than it was sixty years ago. In London, in the second half of the seventeenth century, the death-rate was 80 per thousand; in the eighteenth it had fallen to 50 per thousand; in the first half of the nineteenth to 25; and it is now down to 17½. Rothbury has the lowest death-rate in the kingdom, viz., 11.33. The death-rate goes up the more crowded the population is to the square mile. In 129 districts, with less than 200 per square mile, the death-rate is 18½, while in those which have a density of 6,000 a square mile the death-rate is 30¼. In London, the death-rate from zymotic diseases has fallen from 5.2 in 1840–50 to 2.24 in 1889. The death-rate from consumption has fallen from 2 68 in 1851–60 to 1.55 in 1888. Deaths from diseases of the nervous system in London are fewer than those in Wiltshire. In 1888 the figures were: London, 2.19 per thousand; Wiltshire, 2.67.

In conclusion, the article says: "Sanitary progress demands many things—statesmanlike direction on the part of the central authority, a policy of education rather than of coercion, a gradual development as against fussy interference, intelligent co-operation on the part of the local authorities, a certain knowledge of sanitary cause and effect, a steady sense of public duty. In no part of life is the need of a broad conception of the interdependence of the various members of the body politic so pressing."

NOTES AND NEWS.

A new process of electric welding, known as the Hoho-Lagrange process (from the names of the inventor), is to be worked in Belgium.

A system of electric cabs has been introduced in Stuttgart, and with such success that the cab-horse is likely to be relegated to other fields of usefulness.

Cases brought to test the constitutionality of the McKinley tariff law have been postponed until the second Monday in October.

Pennsylvania and Ohio coal miners and operators will meet in Pittsburg, April 7, to fix a scale of wages to be paid during the coming year.

A Parisian doctor alleges that he has succeeded in conveying by electric currents to diseased internal organs of the human body the constituents of medicines suitable for cure.

A scientist says that there are electric light results from the evaporization of carbon. It is estimated from theoretical grounds to produce this, over 10,000 deg. Fahrenheit is required.

Paint can be made to stick to zinc by first using the following wash (recommended by Boettger): Chloride of copper, 1 part; nitrate of copper, 1 part; sal ammoniac, 1 part; water, 64 parts. This wash-coat is to be left for twenty-four hours before applying to the paint.

A French official industrial department issues the following recipe for preserving wrought-iron chimneys and chimney-flues from oxidation: Brush over the inside of the pipe with a mixture of coal-tar and pine-tar. Then fill it with wood shavings and chips, and set fire to them. The tar is thereby calcined and adheres to the metal, and also covers its surface with carbon. A pipe so treated will last many years longer than one which is left unprotected.

In a recent case, in which the presence of drain-gas was offensively perceptible, the inspector failed to find any defect in the indoor plumbing, and almost despaired of finding a solution of the difficulty, until he discovered a crack in the outside ventilating-pipe, almost in front of the opening of the fresh-air inlet. Thus is manifested another instance of the extent to which the health and lives of the inhabitants of modern dwellings depend the intelligence and conscientiousness of the plumber.—*Register.*

A good water-proof glue ean be made by boiling 8 parts of common glue with 30 parts of water until a strong solution is obtained; add 4½ of boiled linseed oil, and let the mixture boil 2½ minutes, stirring constantly.

The *American Machinist* says that vaseline is one of the best things for preventing bright iron-work from rusting.

A citizen will bring suit against the city of Salem to recover damages for a case of typhoid fever, alleged to have been caused by the offensive contents of a barn-cellar on the adjoining estate. The plaintiff's wife was taken with the fever, and is now seriously ill. The attention of the Board of Health has been repeatedly called to this cellar, but the nuisance was not permanently abated until after the outbreak of the disease, when, by order of the Board of Health, the cellar was filled up.—*Boston Medical and Surgical Journal.*

A New York master plumber is suing an ex-judge for plumbing work completed six years ago. The defense is that the judge's wife ordered the work done without any authority to do so. The New Yorkers evidently do not think that good plumbing comes under the head of necessaries for the family. A Western judge

would, no doubt, decide that the work done for the New Yorker's wife was necessary for her health, happiness and general welfare, and compel him to pay the plumber's bill in full.

Marble may be stained different colors by using the following substances: Blue, solution of litmus; green, wax colored with verdigris; yellow, tincture of gamboge or turmuric; red, tincture of alkanet or dragon's-blood; crimson, alkanet in turpentine; brown, tincture of logwood; gold, equal parts of verdigris, sal ammoniac and zinc sulphate in fine powder. The marble should be not quite polished, but made perfectly smooth, and ready to receive the highest finish before the stain is applied. The longer the stain is left in contact, the better the result.

The great reservoir that is to supply the city of Bombay with water will be the most important engineering work in India and amongst others anywhere. A Scotchman named Glover, aided solely by native labor, has built a huge dam designed to inclose the watershed above the city, and the work will be completed next spring. The dam is two miles long, 118 feet in height, and 103 feet wide at the base. The roadway on the top is to be 24 feet in width, and the stonework will cost £500,000. The lake of water which this dam will imprison will be eight square miles in area, and the connecting pipes are 60 miles long.

The Seine is being purified by collecting into a large conduit the sewage which formerly went into the river. The Island of St. Louis has nine sewers, and these formerly emptied into the Seine. They now discharge into one large sewer, and the whole sewage is now carried across the river by an ingenious syphon arrangement. The syphon consists of two tubes laid in a bed of concrete, the total length being 344 feet, of which 209 feet is in a straight length. The syphon is buried in concrete in the bottom of the river. The sewage of the Isle de la Cite is to be connected with the system by a syphon of a similar construction.

On the fallacy of "clearness" as a test of purity of water, the following from Mayor Powell, director of the geological survey, makes a point of much importance. He is protesting against a proposal to pipe water at the executive mansion at Washington from a "clear" spring, which he says is presumably polluted with the sewage from vaults and cess-pools. He adds: "By a long series of experiments undertaken with a view of determining economic methods of precipitating, and thus removing the finely-divided clay contained in the waters supplied in cities, it was found that there were many different mineral substances, each of which would cause the precipitation of the clay if added to the water in small amounts, but the most powerful precipitant—the one which produced the result by the most minute addition—was sewage. From the point of view of the sanitarian, the limpid purity of the spring and well is a suspicious quality."

THE TRAP VENT LAW.

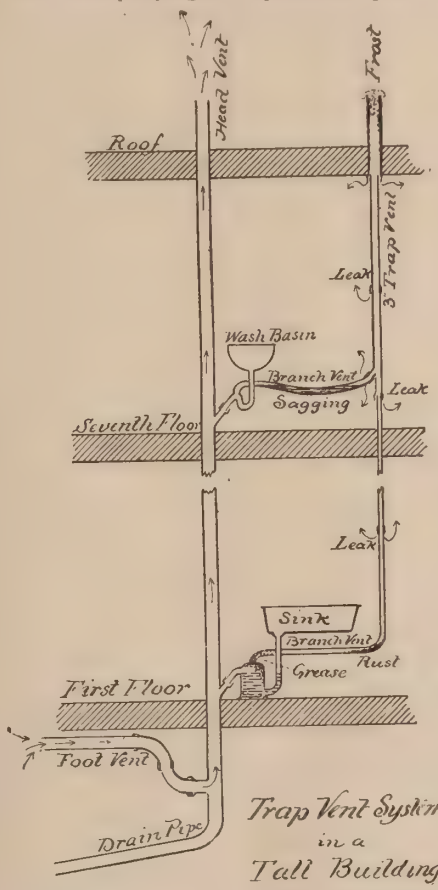
BY J. PICKERING PUTNAM.

The plumbing ordinance now in force in this city, requiring all traps to be vented by a special air-pipe, extending above the roof, or above the highest fixture in the house, is a disgrace to the building professions, and an unpardonable outrage upon the public.

For a long time, the very serious dangers, inefficiency and great costliness of this practice have clearly shown themselves in buildings, and eminent authorities on sanitary engineering have repeatedly called attention to the evil and endeavored to have the law repealed. Their appeals as far as this city is concerned have been made in vain. Those who have the matter in charge have made no attempt to meet the vital objections which have been raised against the law, nor have they given any valid reasons why it should longer be continued in force. A vast amount of useless piping and labor, nearly as great in amount as that which is useful, goes on in our plumbing work, and a much abused public, trusting to the good faith of their advisers, are forced to endure the consequences.

It is time that architects and owners look into the matter more seriously. Plumbing comes quite as much within the sphere of the architect as does lighting, ventilating, warming, roofing, fire proofing, furnishing or decorating, for architecture consists in nothing but the aggregation of all these parts, and style in architectural design is nothing but a graceful expression of the truth in treating them and in combining them into a harmonious whole. At any rate as long as the architect assumes control of these details, provides places for them in his plans, and accepts payment on them from his client, he is bound to interest himself in all of them, at least as far as is necessary to enable him to protect his client from just such glaring abuses as this ordinance for indiscriminate trap venting.

An illustration will serve to make clear what has been said. The accompanying cut represents a part of the drainage system of an ordinary building in which plumbing fixtures are used in several stories over one another. Two trapped fixtures are shown, viz., a sink in the basement, and a wash basin in the attic story. An ordinary "pot" or "cesspool" trap (both allowed by the law), under the basin. The fixtures have large discharge outlets, and waste through short 1½ in. waste pipes, into a 4 in. soil pipe, ventilated top and bottom as shown. If the "trap" or "back vent" law were not in force the fixtures would have been trapped by some form of improved anti-syphon trap, of which several kinds have lately been invented, scientifically constructed to maintain their water seals against any possible disturbances of the air in the soil pipe, due to discharges through it from the fixture above. The plumbing would then have been both simple and safe.



Trap Vent System in a Tall Building.

But the plumbing laws have taken no recognition of these recent simple and serviceable improvements whose value and entire efficiency have been absolutely and thoroughly demonstrated.

The old method, faulty as it has been clearly shown to be, and profitable only to dealers in lead and iron piping, is still enforced, and the entire waste pipe system must be needlessly duplicated, and sometimes more than duplicated to comply with this antiquated law. The result is that the altogether unreliable S trap, and cheap fixtures having outlets too small to effect a proper flushing of the waste pipes, are used for economy, to offset as far as possible the pecuniary burden imposed by this "back vent" system. Thus the plumber is a loser as well as the public, because the increased complication diminishes the amount and quality of the plumbing used in the building, and is rapidly destroying the confidence of the public in plumbers and their work. Many honest and progressive plumbers, recognize this, and are using their influences to have the ordinance revised. They point out the following vital defects in the "back vent" system, which practice has developed:

One of the unavoidable evils is the fact that the mouth of the vent pipe is liable to become clogged with greasy deposits passing through the trap and spattered up into the vent pipe, particularly when used with kitchen or pantry sinks, as shown in our drawing. The evil is unavoidable, because the vent pipe, wherever placed, never receives the scouring action of the discharging waste water as does the waste pipe, but only the spattering therefrom, and this spattering combined with the congealing of the fatty vapors which are carried into the vent pipe by the ventilating current, constantly tends to close, and frequently does close up entirely, the mouth of the vent pipe with grease.

A prominent member of the Plumbers' Association has for a long time had in his shop on exhibition a back vent pipe, completely filled solid for several inches from its mouth, with filth deposited by this action. Clogging is also frequently occasioned by the sagging of the vent pipe in its horizontal runs as shown in the drawing. Water of condensation collects in the bend and flakes of rust will collect in the bend of the vent pipe, and form another kind of obstruction; and finally snow and frost will sometimes seal its upper end.

It is sometimes urged that these deposits can from time to time be removed. This is true, but in practice, as a rule, they are not removed, partly because they are usually inconvenient of access, and partly because the presence of the danger is seldom announced to the house owner until long after the mischief has been done. A system which requires more watching itself than the thing it is designed to protect is worse than no system at all, because it affords a false sense of security, and leads to the use of traps which possess no power themselves to protect when the back vent pipe fails.

Another vital objection to trap venting is the destruction of the water seal of the trap by the air current induced. In practice it is found that this current will, under certain ordinary conditions frequently occurring, destroy the seal of the common 1½-inch seal lavatory S trap, in less than a week, leaving a direct avenue into the house for soil pipe air and sewer gas. By examining our drawings it will be seen that the air of the soil pipe on entering the back vent pipe is conducted directly over the water seal of the trap. Accordingly it stands to reason that an evaporation of the seal must be induced by this current, rapid and dangerous in proportion to the very efficiency of the vent pipe in performing its function of ventilating, whereby it becomes the destroyer of the very seal it was intended to protect. So important is this item of weakness in the "back vent" system, that boards of health have found it necessary, since the system was introduced, to caution the house owners by means of printed circulars, to refill by hand *as often as once a week*, all traps of fixtures not in constant use. Another great objection to the "back vent" system is the dangerous complication and expense it occasions in the plumbing. An enormous increase in piping and jointing is involved by it, whereby opportunities for leakage are immensely increased, leakages which are harder to detect than in the waste pipe system, because water does not pass through them, which by its escape might reveal a defect. Still another objection to the back vent system is that it is utterly unreliable as a protection against syphonage, even when newly and correctly applied as required by law. The atmospheric disturbances in the waste pipes, caused by water falling through them, act with great rapidity in destroying the seals of ordinary traps, as the water plug passes the mouth of the waste pipe under the traps. The partial vacuum behind the plug must be supplied with air, either through the back vent pipe, or through the trap, or through both. Now it happens that friction against the inner walls of a long vent pipe, or of any vent pipe,having sharp bends or partially contracted places in it, frequently causes a resistance to the rapid movement of the air within it, greater than that caused by the inertia of the water in the bend of the trap, and the vacuum in the waste pipe is accordingly supplied by air from the house through the trap, rather than through the vent pipe. If the trap be unscientifically formed, as is the case with the ordinary S trap, its water seal is driven out, and destroyed by the passing through it of this air producing the well-known phenomenon of "trap syphonage." Now, the failure of the back vent pipe through this action is very frequent and has given rise to the invention of the so-called "Anti-syphon" traps, which are traps scientifically constructed in such a manner as to allow air from the house to pass through them without destroying the water seal. They are thus *self-venting*. Several forms of such "Anti-syphon" traps are now well-known which are capable of resisting the severest possible strain of atmospheric disturbance ever encountered in good plumbing practice.

The "back vent" system on the contrary has proved itself, over and over again, to be a total failure in this respect, and no well informed person now thinks of defending the law on this ground. Some other argument must be found in its support by those interested in its continuance. They therefore assert that the back vent pipes are useful to "aerate the branch waste pipes." The branch waste pipes referred to, are shown in our illustration between the traps and the soil pipe. They are here not over 18 inches long, and are thoroughly scoured by the discharge of the fixtures every time they are used. The latest improvements in plumbing fixtures have consisted in constructing them all on the principle of the flush tank; that is, in such a manner that the discharge of their contents shall be rapid enough to thoroughly flush out the waste pipes whenever they are used. Until lately almost all plumbing fixtures were constructed with outlets so small that the discharging water escaped very slowly in a stream hardly a quarter as large as the waste pipe, and, accordingly, scouring was impossible, and filth accumulation in the waste passages certain. Cheap fixtures are still so constructed. But now all scientific and sanitary fixtures are made so amply to scour their waste pipes at every discharge that no further provision for their purification is needed. A wise plumbing ordinance would require all plumbing fixtures to be thus constructed and to be trapped with anti-syphon traps, and such a law could be obeyed without involving the use of any patented appliance. But no, the cheap fixture whose contracted outlet is the chief cause of the fouling of the waste pipes, is still encouraged by the law, as explained, and to undo the damage its use produces, an elaborate and senseless system of aeration is enforced. No one denies that powerful water flushing will remove in a few minutes an accumulation of filth which years of oxidation by aeration will fail to touch, yet cheap fixtures are still allowed to fill the pipes with solid filth, while tons of "back air" pipe are prescribed for the purpose of taking it out again, a thing which every intelligent person knows they cannot possibly do.

The illustration is taken from the soil pipe system of an apartment house, now in process of erection, except that anti-syphon traps and improved plumbing fixtures will be used instead of the ordinary ones shown. The back venting of the traps is here clearly seen to be absolutely necessary. The branch waste pipes are thoroughly scoured out at every discharge of the fixtures, and are aerated by this pure air from the room, which follows each discharge. Indeed, they could be arranged to be cleaned by hand, if there was any need of it, from end to end. The main soil pipe is thoroughly ventilated by fresh air openings at the top and bottom, and the diffusion of air from the pipe into the short branch wastes would, of itself, be ample to aerate them even were no other air allowed access to them. Anti-syphon traps and scientific fixtures would afford absolute safety alone. Yet this outrageous back bent law obliges the owners of this building to throw away more than a thousand dollars by actual estimate, in worse than useless piping, a construction which not only seriously endangers the integrity of the trap seals, and the tightness of the entire waste pipe system, but which greatly mars the appearance of the architecture.

Why have the people allowed this state of things to exist so long in face of the protests of the best authorities in sanitary engineering, and of many of the leading plumbers? It is because the whole matter is in the hands of indifferent or interested individuals. A plumber commenting on the absurdity of the trap vent law, in reply to the question, why plumbers as a body did not get it repealed, remarked: "The back vent law owes its existence to the sanitary engineers, and upon these gentlemen lies the responsibility of getting rid of it again, if they can. The plumbers are not responsible for it; the public does not know enough to do it; and the architects are too much occupied with their decorations to bother with it."

The ordinance in question now stands as follows:

"Every sink-basin, bath-tub, water-closet, slop-hopper, and each set of trays, and every fixture having a waste pipe, shall be furnished with a trap, which shall be placed as near as practicable to the fixture that it serves. Traps shall be protected from syphonage or air-pressure by special air-pipes of a size not less than the waste-pipes."

This is an instance of legislation in favor of a class, namely, the dealers in lead and iron pipe, at the expense of the public.

Since the law was enacted many simpler and better methods of protecting the seals of traps have been invented, yet the law enforces the old method after it has been demonstrated to be the

most expensive and entirely unreliable. It discriminates in favor of the pipe dealer, to the discouragement of invention, and to the great injury of the public. It should at least be so modified as to allow the public the option of employing the simpler method where it is obviously better, or is preferred by the engineer, the architect, the Board of Health, or the Building Inspector.

Moreover, the present law makes no provision against evaporation of the water seal, which has been found, since the back vent law was introduced, to be a source of danger more serious than syphonage.

The following is recommended as a substitute for the present ordinance regarding the back venting of traps:

"Every plumbing fixture shall be provided with a water seal trap, placed as near the fixture as possible, and adequately protected from loss of seal through evaporation, syphonage or air pressure."

BOSTON, March 23, 1891.

THE APPRENTICESHIP QUESTION.

At the third annual convention of the New York State Association of Master Plumbers, convened at Rochester, N. Y., the following was submitted by a committee of the Journeymen's Union, it having been drawn up by them in conference with the Apprenticeship Committee:

That the term of apprenticeship be five years.

That the first three months shall be considered a probationary period.

That each apprentice be required to serve at least three years as a helper.

That the remaining two years shall be at practical service at discretion of employer.

That at no time shall any employer use any apprentice having served less than three years exclusively on new work or at jobbing.

Any master plumber doing his own work shall not employ more than one junior apprentice.

All apprentices shall serve their entire time of five years with the employer with whom they begin, except by mutual consent, or for cause which shall be referred to the investigating committee.

There shall be a standing committee of three members from each association, to investigate any violation of this agreement reported to them. The decision of this committee shall be binding on all concerned.

Except in cases of an appeal from either association, which shall be by unanimous consent of the association appealing, or in case no decision can be had by the joint committee, it shall be referred to an arbitration committee of five or more members, whose decision shall be final and conclusive.

No employe shall be dismissed for reporting any violation of this agreement, nor shall any master plumber be in any way intimidated or harassed by the journeymen for like offences.

It shall be the duty of any member of either association being cognizant of any violation of these rules to report the same to the president of either association, who shall notify the investigating committee of both associations to examine the same.

If any member is found guilty of a violation of this agreement, if it be a journeyman, he shall not be employed by any member of the Master Plumbers' Association, and if it be a master plumber, no journeyman shall work for such master plumber, unless the objection be satisfactorily removed by both parties to this agreement.

In case of any master plumber requiring extra help, he shall employ helpers for such occasion only.

Any person being employed to learn the plumbing trade shall be retained until he has served his entire time, unless as herein above provided.

Each apprentice shall be furnished a card by the Master Plumbing Association, stating date of beginning service, which shall entitle him to a working card, according to that time of service, from the Journeymen Plumbers' and Gasfitters' Association.

The journeymen's union is willing to recognize as apprentices all persons who may be working at the trade at the time the foregoing propositions are adopted, provided they have been regularly following it for three months or more.

No master plumber shall engage any new apprentices for the next five years after these regulations go into effect.

The report was referred to the incoming Apprenticeship Committee, with instructions to confer with the journeymen's committee and formulate suitable apprenticeship rules for submission to all local associations, prior to the next convention.

REGULATION OF HOUSE DRAINS.

Following are the regulations prepared by the Board of Works for the St. Giles District, and a similar code is proposed for adoption throughout London:

All persons proposing to form new or to reconstruct old house drains to be connected with the public sewers shall give at least seven days' notice at the office of the Board's surveyor.

The notice shall be given on a printed form to be obtained at the Surveyor's office, and on which shall be drawn a plan of the premises proposed to be drained, to a scale of 16 feet to an inch, with all lines of proposed drains and their branches and inlets shown thereon in red, with the proposed size of the drains, the nature of the inlets, and the depths of the lower floor of the premises below, or its height above (as the case may be) the level of the pavement outside the said premises.

All drains shall be formed of good, hard, sound, well-glazed stoneware whole socket pipes of the sizes and diameters as will be ordered by the Board. All pipes shall have a thickness of at least one-twelfth their internal diameter.

All junctions of one line of drain pipe with another shall be made at the sides of the pipes, and not at the top, by means of properly formed junction pipes, curved junctions or obtuse angled junctions being in all cases used where practicable, no T or right-angled junctions being allowed, except where absolutely necessary.

All drains shall, where practicable, be laid at least three feet below the floor level, measuring to the tops of the sockets of the pipes; the ground shall be carefully excavated to true hanging lines, according to the inclination and depths given or described, and so that the pipes shall have a firm bearing throughout their whole length, the ground at the bottom of the trench being excavated and shaped out to receive the sockets where they occur, socket by socket, as the pipes are laid. All trenches shall be filled in with good dry sound earth, ballast, or rubbish, carefully packed and rammed in round the pipes to a level with the surrounding earth.

The pipes are to be put together with great care, the butt end of one pipe being forced into the socket end of the next pipe as closely as the nature of the pipes will permit, and the ring or space between them shall be filled in with Portland cement of good quality, mixed in the proportion of not less than one part of cement to three parts of good clean sharp sand, by measure; the cement shall be well and thoroughly worked in, so as to effectually fill the whole of the space, and a band of cement shall be carefully worked round and outside of the pipe to the thickness of the outside of the socket, so as to completely cover the joint.

The connection between the house drain and the public sewer, and the portion of the drain that is beneath the public way, shall be made by the workmen of the Board, and the party requiring the drain shall deposit with the Board a sum of money to be estimated by the Board's surveyor, to pay the expense of such connection and length of new drain, and any other works in connection therewith; and also the cost of the reinstatement of the public way disturbed by reason of the works, and the Board's fee in respect thereof.

All water closets in the lower floor of premises, and all surface drains, sinks, gullies, rain water pipes, and other connections (except vertical soil pipes), shall be well and efficiently trapped by syphon or other approved trap before being connected with the drains.

No water closet will be allowed to be formed beneath the public way.

All water closets in the upper floors are to be trapped before they are connected with the vertical soil pipes, and all soil pipes are to be ventilated from their highest points, by means of pipes of not less than 3 inches in internal diameter, formed of iron or other impervious material, with all joints made air tight, carried up to above the roof of the premises, and covered with approved

cowl, and discharge into the open air as far as may be practicable from all windows, doors, chimneys, or other openings.

All soil pipes shall, where practicable, be placed outside the buildings, and where formed inside shall not be built in the wall, but shall be fixed in grooves, or chases, and be made readily accessible at all times throughout their entire height. All junctions with soil pipes shall also be exposed to view, and easily accessible.

No rain water pipe shall be used as a ventilating pipe.

The heads or highest points of all drains are to be ventilated, either by means of gratings, opening into the open air, if at a sufficient distance from any premises, or by means of pipes carried up to above the roof, as described, for ventilating the soil pipes.

No waste water pipes in the upper floors of premises are to be connected with soil pipes or water closets, and if connected with rain water pipes shall only be with such pipes as are outside the buildings, and the junctions shall be made at such points outside the building as shall be easily accessible at all times.

The main line of drain before being connected with the public sewers shall be trapped outside the house, by means of syphon or other approved trap.

All premises shall have good and sufficient water supply, with all necessary supply pipes, services, cisterns, fittings, and apparatus for the purposes of the water closets, separate and independent to that used for drinking, culinary, and household purposes, and so arranged that no water can be drawn off from such supply for any purpose whatever, excepting to flush such water closets.

The whole of the works in connection with the drains shall be executed with the best materials, and in the best and most workmanlike manner, in accordance with the directions herein set forth, and to the complete satisfaction of the Surveyor, Inspector, or other officer appointed by the Board; and his directions in all matters relating to the works, as to the lines of drains, their depths, sizes, inclinations, mode of trapping, quality of materials or workmanship, shall be abided by. No portion of any drain or works in connection therewith shall be covered in until it has been inspected and approved by such officer of the Board, and at least twenty-four hours' notice shall be given at the Surveyor's office by the person forming the drain, when the works are ready for such officer's inspection; and if any drain is covered in without such notice being given, the Board will by its own workmen proceed to open up and uncover the said drains, and charge the expense of doing so, and of subsequently making good the same, on the party so neglecting.

All old brick or other disused drains shall be broken up and destroyed, and the materials forming them, and all foul and sewage-charged earth and other substances carefully removed from the premises, dry earth, or ballast, or brick rubbish being brought in if necessary, in place of them.

All old cesspools shall be emptied and their contents carted away, and the cesspools filled in with dry earth, ballast, or brick rubbish, and well consolidated. The upper portions of the walls and materials forming cesspools shall also be removed to a depth of 3 feet from the surface of the ground, and carted away.

PLUMBING REGULATIONS.

Chicago, March 23, 1891. Editor The Sanitary News: As a journeyman plumber I wish to enquire from some scientific old head, or of the better informed, if the present law, enforced by the Health Department, while mainly correct in principle is not a little shaky as far as practical application goes? In this I refer to the added amount of ventilation that is now used and of the material specified.

In overhauling two or three jobs of plumbing in the past year where the traps were revented, I found that at the elbows, where the lead vent connected with the iron elbow of the vent pipe, the elbow had completely filled up with rust and had become so hard that it required a hammer and a chisel to clear a passage through it. I found the same thing at the kitchen vents, and at every angle the pipe made.

At a building where I put in the plumbing last July, a closet bowl was broken last week, and I was sent to replace it. I disconnected the brass connection to see if there had been any accumulation, and found that it was already partially filled in that short time by the dropping of rust scales from the pipe above.

I would ask if it is not robbing people to have the Health Department compel owners to go to such an expense, when the work is useless six months afterwards? I would also like to enquire what is the great benefit to revent every trap in a private house where there is no other fixture above, connected to same soil pipe? There is no danger of syphonage except under these conditions.

What is the advantage of extra heavy soil pipe over the old unless it is tested? I have found the old to be made of a better quality of iron, more uniform thickness, and the tarring better. In the extra heavy I find the iron of poorer quality, rough and coarse, uneven in thickness, and often full of sand holes. If it is worth while to revent an already ventilated fixture, is it not the duty of the Health Department to specify materials of the proper kind that will accomplish the object for which they are intended, and not put a greatly increased expense on the ignorant public that is of no utility in a few months?

Yours, A Journeyman.

USE OF GALVANIZED IRON FOR ARTESIAN WELLS AND FOR THE CONVEYANCE OF DRINKING WATER.*

The writer recently received analysis for potability a sample of water from an artesian well, which proved to be of somewhat unusual character. The well had been sunk a few months ago on a homestead property, situated a short distance beyond the northern boundary of this city. It was seventy-eight feet in depth, and the outer casing as well as the inner tube were of galvanized iron.

The water had been previously analyzed by another chemist and was pronounced by him to be contaminated with sewage. As no source of contamination was known to exist near the well, it was thought a mistake had been made.

My analysis showed, however, that water contained an enormous amount of free ammonia, and also an extraordinarily large amount of zinc in actual solution.

I subsequently learned that the pipes were discovered to be very much corroded in the short time they had been in use.

I ascertained that there was no cesspool drain, manure heap, or any other source of contamination within 200 feet of this well. At that distance there is a stable, but the stalls are drained by a cemented terra-cotta pipe, which is carried to a considerable distance further away from the well. As regards surface drainage, the well is favorably situated, being on higher ground than the stable. The nearest source of contamination on the adjoining premises is at least 500 or 600 feet distant.

In every respect, therefore so far as known, the well appears to be properly protected as regards location. As, however, the well is deep and the amount of water abundant, it is reasonable to conclude that a water-bearing stratum draining a very large area, or perhaps a strong flowing underground stream has been tapped. Hence, the water may have become contaminated by sewage at a very great distance from the well. Such instances have been known to occur. In this way I am inclined to account for the free ammonia in this water, which has possibly been increased by reduction of nitrates previously present in the water induced by contact with iron and zinc.

There can be no doubt that the water has been, somewhere in its course, contaminated with a large amount of nitrogenous organic matter, probably animal sewage.

A peculiar feature of this water is the large amount of zinc which it contains, and the fact that the whole of it is in solution. On heating or partial evaporation, the zinc separates as a film on the surface of the water.

That water has a solvent action upon metallic zinc has been known for a long time. As early as 1778 it was alluded to by M. de la Falie, a French physician and chemist. Thenard and Gay Lussac and, in 1813, Vauquelin and Deyeux reported upon it to the French Academy of Sciences. Chauffele, in 1848, and Payen and Chevallier, in 1854, confirmed it experimentally as regards ordinary water and even distilled water. Similar results have been

*By Ruben Haines. Reprinted from the Journal of the Franklin Institute.—*Architecture and Building.*

reported by others since that time. In most of these cases, only traces or very small amounts of zinc were dissolved. Prof. W. R. Nichols, of Boston, some fifteen years ago, stated that he always expected to find zinc in water which passed through galvanized iron pipe. He found that Lake Cochituate water, which had remained undisturbed in pipes at the Massachusetts Institute of Technology for thirty-six hours, the pipes having been in use for eight or nine years, contained a small amount of zinc in suspension, and 0.062 grain per gallon in solution.

In another case, when the analysis of the water gave suspicious evidence of contamination with sewage, he found a trace of zinc in suspension, and 0.843 grain per gallon in solution.

The mode of action of common potable water on zinc is understood to be, first, the formation on the surface of the metal of a coating of oxide of zinc, which is then acted upon by the carbonic acid generally present in the water, converting it into a mixture of oxide, carbonate, and according to Pettenkoffer, an oxyhydrocarbonate, or as now termed, hydrated basic carbonate, which gradually becomes more or less separated from the metallic surface and is carried in suspension or forms a film on the surface of the water, while a small part dissolves.

In the case before us, I think the oxide and carbonate of zinc have combined with the carbonate of ammonia to form the double carbonate of zinc and ammonia, which is insoluble in water, but very soluble in carbonate of ammonia, the excess of carbonate of ammonia in the water thus holding it in solution. This combination of salts is decomposed by boiling water or by heating on the water bath.

I found that both commercial zinc and chemically pure zinc, each in the coarsely "granulated" or feathered condition, were rapidly acted upon by a cold dilute solution of carbonate of ammonia, from which, after twenty-four hours' contact with zinc, a copious precipitate of zinc sulphide was thrown down by H_2S after acidifying with acetic acid.

It is not unusual to find considerable zinc in suspension either as hydrated oxide or carbonate in waters, for instance, that have been retained for some time in galvanized iron, "circulating boilers" in dwellings, especially in the case of new boilers.

I once had in my possession a piece of lead pipe which had connected a "circulating boiler" to the "water-back" of the kitchen range, and which at one point was almost completely stopped up with a reddish-white deposit; and this deposit proved to be composed principally of oxide and carbonate of zinc, derived, no doubt, from the galvanized iron boiler.

I have also observed in one instance a scum or film of zinc hydrocarbonate almost completely covering the surface of the water in a cedar tank after the water had entered this tank through several hundred feet of galvanized iron pipe leading from a spring-house. The spring water had been until near that time quite pure, but was contaminated during heavy rains by a shallow well a few feet distant, which contained decaying vegetable matter and the water of which yielded a large amount of free ammonia, but gave no evidence of sewage pollution.

There can be no doubt that, like the case of the artesian well before us, the excessive amount of ammonia in the spring water had a solvent action on the zinc coating of the galvanized pipes, but that on free exposure to the air in the tank the hydrocarbonate of zinc was separated, as it appeared in a crystalline film on the surface of the water.

The amount of zinc thus carried into the water, either in suspension or in solution, appears to depend not only on the impurities in the water, but also upon the quality of the galvanized iron; both as to whether the process of coating with zinc has been properly done and as to the purity and texture of the zinc itself. If, for instance, the iron has been allowed to become spotted with rust, even if the rust is apparently well cleaned off before dipping the iron surface into the zinc bath, a more rapid corrosion, it is said, is liable to occur when the zinced article is immersed in water.

As regards the injurious effects of potable water containing zinc, the zinc oxide or carbonate carried in suspension in any large amounts would not be likely to cause trouble to health, because most people would usually refuse to drink any water so turbid without filtering it. Hence, only the smaller amounts of suspended zinc and that which is in solution need be considered.

While it is true that in the case of the artesian well described in this paper no chemist would be likely to advise the use of this water on account of the strong suspicion of sewage contamination, yet it is suggestive of possibilities where the water is not submitted to a chemist for examination.

(To be continued.)

VENTILATION.

Probably all, or very nearly all, says the *Engineering Record*, of the lawyers, bankers, brokers and business men of the country would object most emphatically to wearing underclothing which had just been taken from the body of another person, or to drinking water in which a man had dipped his hands, or to eating food which had been in another person's mouth; and this objection would be raised even if they knew the person by whom the clothing, or the water, or the food, had thus, in their opinion, been contaminated, was as clean and as healthy as themselves.

Very few persons, however, object seriously to drawing into their lungs air contaminated with the effluvia and exhalations from the lungs and skin and clothing of a number of people such as they meet in concert-rooms, theaters, courts of justice, and other places of assembly, although they know that a certain proportion of these other persons are neither clean nor healthy. They may know from the sense of smell that the air of the room into which they are entering is impure; they may tell you that if they go to a certain theater they will have the "theater headache;" but they will go in all the same. It is not the custom of society to demand a supply of reasonably pure air. We do not expect it when we go to a dinner party, or a reception, or a ball at a friend's house, and, as a rule, we do not get it under such circumstances.

At irregular intervals some physician gives a lecture in which he very disinterestedly explains that a considerable part of his practice is due to the breathing of foul air by his patients, or some journalist with a sore throat and a theater headache pens a trenchant editorial on the need for pure air in public places of amusement, or the proprietor of a patent ventilator calls attention to the statistics of the British army as given thirty years ago, to prove the necessity for his device; but all this effects little change in the arrangements in our habitations or buildings of public resort. Architects do occasionally include what they call ventilating flues in their plans of public buildings, but, unless for hospitals, they do not usually pay much attention to them; and even if they are provided, it is very seldom that any arrangements for fresh-air supply are made. We are not specially blaming the architects for this state of things, for they supply what the public demands, and for the class of buildings for which the services of architects are usually requested it is the external appearance and the internal decoration which are the points of most consequence in the eyes of their patrons. Nevertheless, an educated architect ought to know better than to furnish plans so defective in means for ventilation as are those of many of our public buildings, and if he does know better he should not neglect this point merely because his employer knows and cares nothing about it.

The essential point is to provide the means for introducing and properly distributing a sufficient supply of fresh air in such a way that it shall not cause discomfort, and especially so that it shall not cause the room, or any part of any person in the room, to become uncomfortably cool in cold weather. Satisfactory ventilation in this climate is, therefore, a problem of satisfactory heating as well.

The heating apparatus for a large building is usually supplied under a special contract, awarded to the lowest bidder, the specifications being more or less vague and indeterminate. The object of the bidders is to furnish the smallest amount of boiler, mains, radiating surface, valves, etc., which will comply with the specifications. If these specifications were full and complete as to the work to be done in each room in the way of heating and ventilation, but without details as to the apparatus, the bidders would have to do some elaborate figuring if they wish to furnish just enough, and no more, air warmed to a proper temperature by just enough radiating surface and no more, etc., etc.

Such calculations of minima are not easy to make, and few bidders would probably make them.

We believe, however, that the day is not far distant when

public opinion will demand, and when architects and engineers will furnish, in accordance with this demand, drawings and specifications for heating apparatus for public buildings at least as minute and accurate as those which are now provided for other details of construction; and when this occurs ventilation will also be provided for. Meantime we would say to all building committees, and to all whose approval of plans and specifications for a building to be erected either for themselves or for others is requisite, do not approve such plans and specifications until you are satisfied that they provide for the admission in cold weather, to each room of enough air to secure proper ventilation, and also for the comfortable warming of each room while this cold air is being admitted; and if you do not know how much air is required, or whether the plans submitted will effect what is wanted in the way of heating and ventilation, get the advice and opinions of some one who does, and pay for them.

WATER SUPPLY AND ITS DEVELOPMENT FOR SMALL CITIES IN THE WEST.*

(Continued from page 233.)

Though the water in a filter gallery or system of wells fluctuates with a rise in an adjoining body of water, this does not prove an inland flow, but, as nearer the fact of the case, that this rise dams the approaching water in the soil, causing it to rise therein to accommodate itself to the new conditions; as for example—the water in wells sunk in the sand closely bordering the ocean has been found to fluctuate with the tide, while maintaining its freshness; also in a very cold climate the ranges of the temperature in the water collected in an uncovered gallery was noticed to be very small, compared with that in a river bordering the gallery. No doubt there is always some inland filtration at times of a sudden rise in a stream, the extent depending on the condition of the soil at the time; but the danger of fouling a well-located water supply in the neighborhood is very slight.

As has been said, the only way of finally determining a water supply after the site has been selected, is by actual tests, and such tests must be manipulated in a very careful manner or the results obtained will be over-estimated. A good way to make these is as follows: Sink an open well three to five inches in diameter into the water bearing strata, remove the earth within the tube by means of a jet of water forced through a small pipe, one inch to two inches in diameter, by a steam pump. By this means the character of the soils passed through can be observed. At various distances from this well, and in at least two directions, drive small pipes 1½ to 2 inches in diameter, in line, to the same depth as the first well, and so as to permit free access of the water at the bottom. A small pipe for a pump connection can be inserted inside the large well and a pump attached. For this purpose a steam pump is preferable, or one that will permit of a continuous pumping for any length of time, practically fulfilling the requirements of actual service. The fluctuation in all the wells should be carefully noted at stated intervals and at various speeds of operation; the amount of water furnished can be measured by any convenient and reliable means. Whenever pumping ceases, the time required for the water to assume its original elevation in the wells, and the rate of change in this transition is to be carefully observed.

It will be noticed that it takes the water in the ground considerable time to accommodate itself to any change of conditions so that for certain results long periods of pumping are necessary, and for this reason the work should not be hurried. Frequently several water bearing strata will be encountered separated by layers of clay, the upper ones being generally supplied from local water-sheds and the soonest affected by draught and drought, while the deeper ones may collect water from a very large collectable area, and give a large and unintermittent yield. It is best to penetrate these deep and more extensive reservoirs to insure success.

That such tests are the notable exception throughout this country is true, and with the present haste to develop a scheme as soon as decided upon, the disinclination to spend money on preliminary investigations is very strong. When properly made they require a reasonable expenditure of money. The methods suggested, however, are not those to be put into practice by the novice or ordinary well-digger. The required plant can be found in any town, but the man under whose supervision the work is to be done should be a specialist, whose study and experience makes him familiar with all questions of water supply, the laws of flow, the usual conditions of ground water storage, and one who is trained to minute observation and analytical methods of reasoning.

When a general public sentiment favors a water supply, the time for action is at hand, not, however, in a way to make a public issue of the question for the time, for such decisive action is not propitious.

The usual custom of appointing a commission or committee to investigate the matter is a very good one, and their trip around the country to inspect various water-works gives them a knowledge of the subject which will be of great assistance to them in their future duties. It is serviceable this far but no further. It is surely a mistake to let such an investigation conclude to them that a system of water supply or water-works in any neighboring town is exactly what is wanted in their own town, and so recommend to the people or common council; for as yet there is nothing to show its adaptation to local circumstances and conditions.

The best way for such a committee is in the very beginning of their work to select a competent engineer to study the question with them, to determine by necessary tests the best locality for a water supply, its quality and amount, and the best means of developing it. Let him submit a report, with an estimate of cost of the entire water-works best adapted to the needs and means of the community. This puts the matter in a tangible form to present to the public for discussion and vote. They know then just what they are doing and how far they can carry their undertaking. Such a preliminary investigation is not putting the people to any extra expense, for it will have to be made before any reliable and complete set of plans are prepared, and the proper time to make it is before any popular vote is taken on the issue of bonds for the work or any franchise granted to a constructing company. In most cases where a franchise is granted the people cannot be too particular from where their water supply is coming and how it is to be preserved from contamination. Such an investigation and report as the one suggested is a community's safe-guard, and if municipal authorities would take such a rational view of the case they would often save themselves vexations, delays and embarrassing failures. If some method of this kind is not adopted, but the works projected and constructed in an unsystematic way, it is simply a question of a few years before the expert will be called upon to perform the very work that should have initiated the enterprise, and it may be at greater expense to the city, for the remodeling of a plan is by no means economical or satisfactory.

Committees who have located their water supply in the corporate limits of the town, where the soil is for years liable to defilement, whether the town be sewered or not, have particularly this question to consider in a two-fold way: First—Ground in a town is expensive, and they usually have made little or no provision for the future extension of their works. Second—The location is so opposed to any proper sanitary regulations, that it is only a matter of a little time before a healthy public sentiment will fully appreciate this circumstance, and compel a relocation away from all possible chance of such foul pollution. The method of development, as well as the location of a water supply, is a fundamental consideration, and is to be studied as an isolated problem, as far as the most feasible adaptation of a means to an end is concerned. It is bad policy to assume, as is sometimes done, that every means of developing a water supply is worthy of a general application, even over a limited territory, because it has been successful in any one or two places. This is simply "putting the cart before the horse." The condition and peculiar requirements of the town and surroundings must first be determined, then apply that method most suited to the location.

In this section of the country, where the supply comes from a river or a reservoir, connection is usually made directly with pumping machinery. Sometimes auxiliary filters are constructed in the banks, but experience has shown that these very often become useless by clogging with silt, and that they need constant attention. Artificial filters are now constructed by several companies, and great pains is being taken to make them successful as an attachment to a water-works system. Sediment is very rapidly disposed of by settling in basins properly capacitated to the size of the water-works system.

*Read before the Engineers' Club of Kansas City, by WYNKOOP KIERSTED.—From the Journal of the Association of Engineering Societies.

When ground water is the source of supply, resort is usually had to infiltration galleries; large open wells, systems of drive wells arranged in gangs, and bored wells, sometimes the last of large size; each well fitted with an independent steam pump. Infiltration galleries are usually constructed in the porous material near a river. Such galleries should be kept covered, for the collected water, being in reality filtered, is liable to pollution if exposed to the light and heat of the sun. Open wells are one of a variety of infiltration galleries covering a small area of ground, but penetrating deeper to reach a suitable water bearing stratum; in relation to them it has been determined that the bottom area alone can be depended on to furnish water. Thorough tests should precede the sinking of such wells, so that the various materials to be encountered, and their depth, are definitely known and the most satisfactory point of stopping the excavation thereby determined. Serious mistakes have frequently been made by unintentionally uncovering deep beds of quicksand or clay, which a little knowledge in advance would have prevented.

Perhaps the best example of drive wells arranged in gangs is the system used in Brooklyn, N. Y. Here the wells are in pairs on each side of a main suction pipe. In distributing drive wells along a pipe or in any manner to draw water from the ground, it is necessary first to know the maximum demands on the system, the rate at which the soil is capable of furnishing water, and the depth of the water-bearing strata. No well should, during its maximum drought, approach the limiting capacity of the soil to furnish water; nor should the draught be so severe as to permit the hydraulic grade line to fall below the top of the entrance to the pipe, as this will constantly impair its action. As an example of what an improper distribution of wells will do, a case may be cited where a failure occurred due to the incapacity of the soil to furnish water. In this case the wells, about thirty or thirty-five in number, were arranged in a circle twelve feet in diameter, all having entrance to a tight (?) drum. Under a slow rate of pumping they operated very well, but before the draught reached the specified requirement, 1,000,000 gallons per twenty-four hours, the supply failed. There was water enough in the sub-soils, as had been determined by experiment, but the fineness of the material prevented a flow rapid enough to supply the demand from so limited an area of pipe distribution. One-third to one-half of the drive wells were inoperative. Had the same number been properly distributed the result would certainly have been very different.

Various methods of distributing the wells are pursued, but unless good judgment is shown in the adaptation of the method to the conditions and in their mechanical adjustment, they fail to give the best results. Bored wells five to eight inches in diameter are sometimes used, when the water bearing material is at a considerable depth, each well being supplied with an independent steam pump. Such plants, being low service, require a storage reservoir of considerable capacity at the pumping station, additional high pressure pumping machinery for the distribution system, and large boiler capacity. The operating expenses are necessarily heavy, due to so many independent pumps, and the large amount of fuel consumed in the manufacture of steam. Each of these methods of developing a water supply has its adaptation, but none can be recommended for any general use. In fact, it is not difficult to conceive of conditions, liable to be encountered, where each may, in turn, have superior merits, although instances where the last method can be economically and advantageously applied to waterworks are exceptional. Sometimes a combination of two or more methods produces good results. A choice of method, whether mentioned here or not, depends upon so many things, chiefly upon the requirements of the locality, as developed by test, that few suggestions can be given. It is best to rest the matter with a competent specialist, who is familiar with all these things, and let him arrange and design the plant. Such a disinterestedness is necessary in the adviser, that he can investigate the matter for the public good and not be biased by personal interests, in patented devices and so-called systems of water-works.

By looking over official records and the results of health commission investigations the proof will be found ample to justify the most vigorous protests against the use of water from wells or in the immediate vicinity of any town. It is a historical fact that the health of cities and towns is largely controlled by the source and character of their water supply, and thousands of cases of cholera and similar diseases are directly traceable to a water supply contaminated by cesspool drainage and fœcal matter. It is not necessary to cite the many proofs of this statement. One has only to read to find enough to convince the most skeptical. It was once stated by the Mayor of New York, namely, "When cholera last visited our city every case could be traced to the use of well water, where not a single case occurred where Croton water was used." In the terrible scourge in the small town of Plymouth, Pa., in 1883, the death of every individual could be directly and most conclusively traced to a contaminated water supply emanating from a single patient of typhoid fever.

HUMOROUS VIEW OF ADVERTISING.

Printers' Ink says: "In this age the businese man who does not advertise is doomed. Every style of advertising pays, but the greatest results are acquired from utilizing the advertising columns of a properly conducted journal. An inch advertisement in a newspaper is worth a dozen on a fence. We never knew of but one case in which advertising did not pay. It occurred in Chicago. A burglar overlooked eighty dollars in a bureau drawer, and the papers so announced. He returned the next night and not only secured it, but a suit of clothes besides. The man who doesn't hang out his shingle and advertise, dies and leaves no sign. The right kind of eyes for business men is advertise. Puffs in newspapers help many merchants to 'raise the wind.' No class of people realize the benefits of advertising as much as actors and actresses. Mrs. Langtry did not object to members of the English aristocracy butting and clawing each other on her account, as she realized the benefit of the free advertising she got. A year or so ago, a half-crazy actor named O'Conor, who was making a hit, begged the newspapers to let him alone. They did so, and soon afterward he was out of a situation and hauled up for debt. Death and discontinuance of an advertisement is regarded as a positive evidence of going out of business."

AMERICAN WATER WORKS ASSOCIATION.

To Presidents and Chairmen of Water Companies and Water Boards.

Gentlemen: As the time approaches for holding the next annual convention of the American Water Works Association, we wish to call your attention to the desirability of having a representative of your Company or Board in attendance.

The Association will meet in Convention this year at Philadelphia from April 14th to 17th, the same being the Eleventh Annual Convention of the Association, whose membership has now reached a total of 346, and whose annual meetings are each year more instructive and profitable to its members.

The coming Convention promises to be one of unusual interest and advantage. Topics will be discussed which have a vital bearing upon the principles underlying the construction of our plants and their economic operation. Also upon the relations existing between water boards or companies and their patrons; also to their relations to the municipalities under whose franchises their business is conducted.

The discussions following the various papers presented take a wide range, the brightest minds as well as the most mature and scientific thought and experience in our calling are represented, and the results to all water works men in attendance cannot fail to be in the highest degree interesting and profitable.

Special rates of railroad fare and hotel accommodations at Continental Hotel have been secured, and we urge you again by your presence, or that of your representative, to assist the Association in its effort to promote wider information and more fraternal relations in our responsible avocation.

Yours respectfully, Wm. B. Bull, President.

ABRAHAM LINCOLN AS AN INVENTOR.

Now that the Patent Centennial Celebration, to be held in Washington, April 8, 9 and 10, is so close at hand, and inventors and manufacturers from all parts of the country are manifesting the greatest possible interest in the event, and so much is being said and written about the centennial, the history of the patent system and patent office, of famous inventors and curious patents, it might be interesting to know that Abraham Lincoln was an inventor, and received a patent on the 22d day of May, 1849, num-

bered 6,369. for an improved means of combining adjustable buoyant air-chambers with steamboats or other vessels, to enable their draft to be readily lessened to permit them to pass over bars or through shallow water, without discharging their cargoes.

These adjustable buoyant air-chambers were secured to the sides of the vessel (which in this instance was an old-style Ohio steamboat), and were formed with top and bottom portions composed of a plank or plate of metal of suitable stiffness, and with flexible side portions of India-rubber, or textile material thoroughly water-proofed. These buoyant air-chambers were very similar in construction and operation to an accordion or a blacksmith's bellows. The vessel was also supplied with a main shaft or shafts, and with sliding spars or shafts, the latter passing down through the buoyant chambers and made fast to their bottoms; also with a series of ropes and pulleys, whereby, by turning the main shaft or shafts in one direction, the buoyant air-chambers would be forced downward into the water, and at the same time expanded and filled with air for buoying up the vessel by the displacement of the water; and by turning the shaft or shafts in an opposite direction, the chambers would be contracted into a small space and secured against injury.

It is also stated that President Lincoln was the inventor of the very ingenious method of emptying boats of water when they had become so filled that bailing was necessary. He bored a hole in the bottom of the boat, and by heading the boat up stream, in an opposite direction to that in which the tide was moving, a suction was formed which very quickly drew out the water through the opening bored in the bottom of the boat.

Washington, D. C. Edward T. Fenwick.

PLUMBING NOTES.

Mr. Schubot was arrested for doing defective plumbing work at 166 Maxwell street, and fined $150 by Justice Doyle. He was arrested at the instance of Inspectors Michael Connell and Fallon. C. J. Boyd, doing plumbing work at 550 South Halsted street, was arrested at the instance of the same officers, and was fined $110 by Justice White. Fines have also been assessed against Herman Mund and Hanslein, plumbers, for defective work within the last month.

John J. Carey, ex-secretary of the National Association of Master Plumbers, has been quite sick at the Brevoort House, but is able to be up again.

Mrs. A. F. Irons, secretary of the Ladies' Auxiliary Association, has issued invitations for a "social and dance," to be given Tuesday evening, April 14, at Emerson Hall, 45 East Randolph street.

Ex-President Ed. J. Hannan is going into the building business quite extensively at Washington, D. C. There is push enough about the ex-president to make a marked success of anything he puts himself to.

Reports of prosperity reach us from the firm of Kellogg & Van Houten, 45 and 47 Mechanic street, Newark, N. J., manufacturers of plumbing material and sanitary specialties, and agents for the Sanitas Manufacturing Company.

If you will scratch the man on the back who complains of defective plumbing in his house, you will find a man who does not want to pay the price for good plumbing. The best quality of shoes cannot be bought for two dollars a pair, and the same rule holds good in all business.

There are many plumbers in the country who ought to be members of the National Association. So well has the association been conducted that a membership in it is a guarantee of efficiency at the trade.

The following lines have been floating about during the winter freezes, and are still doing duty in the joker's column:

The honest old plumber,
Who starved all the summer,
Now listens with joy to the boreal breeze;
When it gets below zero
He sings, the old hero:
"It's a cold day for plumbers when nothing will freeze."

There is a field for plumbers in providing for the disposal of sewage of the isolated country, or suburban residence or large institutions where there is no sewer connections possible. There is considerable demand for this work, and the plumber could do this in connection with his plumbing, as well as to leave that part of the work to an engineer.

Take the advancement that has been made in plumbing in the last few years out of the calculation, and the progress of sanitation would not have near so much of which to boast.

Mr. E. Baggot has made an extensive business trip East.

How can plumbing be properly inspected without inspectors who understand plumbing? It does not seem that city councils should have to labor very hard or very long to solve this problem.

J. J. Wade recognizes the value of water in keeping a plumbing and drainage system clean and pure, and the invention of his flushing appliances has made it possible to apply the water in such a manner that its effects will be immediate.

Those manufacturers or inventors of traps who have not forwarded descriptions of their inventions to The Sanitary News, as requested, and who wish to be represented in the series of descriptions of these traps soon to be published, will please forward the matter as soon as possible, as publication will begin soon. This proposition is made to all manufacturers and inventors of traps who wish to avail themselves of this opportunity to put the claims of their traps before our readers.

We often receive anonymous letters from members of the trade who undoubtedly expect to see them in print, and who are disappointed at not finding them published. We are at present in receipt of five such letters, some of which have merits that would entitle them to publication if their writers were known to us. But, as received, we cannot publish them, as our rule is to give publicity to nothing the origin or author of which we do not know, or whose name is withheld from us. We would prefer to publish the author's name with his article; yet we do not insist on this, so long as his name accompanies his communication, as an evidence to us of good faith on his part. If those who have sent us the communications referred to will send their names and address—not for publication, but for reference—we will give place to the articles; otherwise, we cannot do so. We are always glad to receive matter for publication of a general or local interest, but the writer's name must accompany such articles to secure their publication.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: L. G. Hallberg has let contracts for a seven-story warehouse, 40x160 feet, to cost about $30,000. A. G. Ferree has drawings for a three-story store and apartment building, to have two fronts, one on Normal parkway and the other on Stewart avenue, Englewood; cost, $50,000. Robert Rae has plans for a seven-story apartment house, 100x100 feet, for Louis Steinfeld, also for a ten-story hotel, at Sixty-third street and Stony Island avenue, to cost $500,000. Architects Geyer and Norton are engaged on plans for a block of stores and flat buildings, on State street, near Sixty-sixth street in Englewood. They will be three stories and basement, 100x80 feet, and cost $35,000. I. Z. Zarbell has planned a six-story and basement factory at Green and Van Buren streets, to cost about $75,000. He has also planned a seven-story and basement wholesale store, at Randolph and Union streets, to cost about $50,000. He has also made drawings, for a four-story and basement store and flat building, on Clark street south of Chicago avenue. O. W. Marble has drawings for a block of five residences, to have a frontage 105 feet, on Forty-first street and Grand boulevard; cost about $60,000. He has also planned two three-story residences, on Grand boulevard and Forty-third street, to cost $25,000. Charles Frost has prepared plans for a four-story apartment house, 93x153, to be erected at the corner of Belden avenue and North Clark street by W. C. Grace. It will be constructed of pressed brick, stone and terra cotta; cost, $100,000. H. H. Sprague has planned a three-story and basement residence for Henry Crawford, to be erected on Calumet avenue, near 23d street. Exterior will be of stone and brick; $30,000. S. S. Beman is planning a seven-story warehouse, to be erected on Clinton street, between Madison and Monroe, by J. M. Clark; stone

construction; cost, $60,000. E. B. Marshall has prepared plans for a rear addition to the club house of the Ashland Club at Washington boulevard and Wood street. It will be two stories, and will be constructed of brick and stone; cost, $20,000. R. G. Pentecost has prepared plans for a handsome three-story residence, for C. L. Willey, to be erected on Michigan avenue, near Thirty-fourth street; cost, $25,000. W. L. Carroll has prepared plans for a two-story laundry, to be built at the corner of Twenty-seventh street and Napoleon place by the Columbian Steam Laundry Co.; cost, $10,000. Treat & Faltz are receiving bids for the erection of a three-story and basement fire patrol building to be erected at 210 South Peoria street by J. Tomlinson. Hetherington & Warner have planned a three-story and basement store and flat building, to be erected at the corner of Chicago avenue and Wesson street by Joseph Casagrande; cost, $20,000. Clinton Warren is preparing plans for reconstructing the Beaurivage apartment building at the corner of Michigan avenue and Van Buren street into a modern hotel, for Leander J. McCormick. Maher & Corwin have planned two two-story residences for C. S. Johnson, to be erected on St. James place, Lake View. They will be of stone exterior; cost, $14,000. H. B. Wheelock is preparing plans for two three-story and basement residences, for Franklin H. Marin, to be erected on Lake Park avenue, near 32d court; will be constructed of rough stone; cost, $22,000. He is also preparing plans for a two-story and basement flat building, for R. E. Evans, to be built at the corner of Wallace and 35th streets; cost, $10,000. L. G. Quackenboss has prepared plans for three three-story and basement dwellings, to be built on Oak avenue, near Vernon, by Mr. Frost. They will be constructed of stone, with hard wood interior; cost, $20,000. He has also planned a two-story flat building, for L. J. Walsh, to be erected on West Madison street, near Sacramento avenue; cost, $10,000. J. E. Scheller is planning a four-story and basement warehouse, for Joames Bros., to be erected at Green Bay, Wis. It will be constructed of stone and brick; will have elevators and steam heat; cost, $85,000. Pond & Pond have prepared plans for the Butler Gallery, to be used as an art gallery and a station for the Chicago Public Library, to be erected at Hullhouse, Ill.; to be constructed of brick and stone; cost, $5,000. E. B. Butler is the owner. H. J. Jeffray and Ernest Johrenstein have planned a three-story and basement flat building, to be erected on Evans avenue, near 43d street, by L. L. Tabor; cost, $8,500; also suburban homes, two stories, for E. A. Mason, to be erected at Birchwood Beach; cost, $4,000; also two dwellings, one on West 53d street, near Madison, for J. E. Wallace, and the other at Rogers Park for the same person; each to cost $4,400.——Brooklyn, N. Y.: Constable Bros., 151 Broadway, N. Y., are at work on plans for block of apartment houses and stores on Myrtle avenue.——Philadelphia, Pa.: William J. Scott will erect ten dwelling houses on the west side of 47th street south of Paschal. Fourteen dwellings will be built on the south side of McKean street west of Front by Leonard & Guenther. Architect Frank R. Watson has prepared plans for a proposed addition to the Hermon Presbyterian Church of Frankford. Plans for a new hotel to be built at Mount Holly, N. J., are being prepared by Architect S. D. Button. Geissinger & Hales have plans for Bromley's new mill at Front street and Lehigh avenue. At Alleghany avenue and 15th street George W. Gunn will build a number of dwellings. W. W. Frazer has just purchased a lot, at Jenkintown, upon which a new Episcopal Church will be erected. Ten dwellings of new design will be erected at 52d and Market streets by W. A. Arthur & Brother. John G. Ruff will build ten houses—seven on the west side of 42d street south of Powelton avenue, and three on the south side of Powelton avenue west of 42d street. A double house of stone will be erected at Germantown for J. W. Moffley from drawings by Architect M. Fielding. Carlisle Joy will erect eight handsome five-story residences of modern design on Fairmount avenue east of 50th street. Joseph S. Hagan will erect a number of dwellings at 3d and Cambria streets. A number of dwellings will be built at 46th street and Woodland avenue by C. C. Moore, the builder. Twelve dwelling houses will be built by Waelfle & Schmunk on the north side of Cambria street west of Marshall.——Pittsburg, Pa.: Architect F. C. Sauer has plans for a three-story brick and stone building to be erected on 13th street, south side for the South side Turners' Association. The building will be 60x121 feet. Architect A. E. Linkenheimer, Allegheny, has prepared plans for a brick tannery, having a floor area of nearly two acres. Mr. Harper, of Joseph Horne & Co., is taking bids for eleven houses to be erected in the Fourteenth ward. W. H. Boorman will also build on the same plan this season. L. H. Smith, of the Smith Woodenware Company, has purchased a lot on Liberty street. It is his intention to erect an eight-story stone front business house, to cost $45,000.——Milwaukee, Wis.: Van Ryn, Andree & Lesser have designed for Richter, Schubert & Dick a seven-story office and store building, to be built on Grand avenue at a cost of $65,000. John Black will erect a six-story business block, at the corner of East Water and Detroit streets at a cost of about $150,000. E. Townsend Mix & Co. have plans for the new Hanover Congregational Church, to be erected on the south side at the corner of Walker and Greenbush streets. Architect W. D. Kimball has plans for the new Institute and Parish House to be erected on the grounds of All Saints Cathedral. The building will cost about $23,000. Architect Charles Kirchoff, Jr., has plans for an $18,000 residence to be erected on Island Boulevard between Twenty-seventh and Twenty-ninth streets for W. A. Starke, of C. H. Starke & Co. J. Kappel will erect this season a three-story brick building for hotel purposes, at the corner of Seventh and State streets, which will cost $8,000. The architects are Rau & Kirsch. Mayor Somers is having plans drawn by Rau & Kirsch, for a three-story store and office building, on Third street near State. The building will have a stone front and will cost about $15,000.——Washington, D. C.: Architect N. T. Haller has plans for a block of thirteen two-story and basement dwellings that Ed. J. Hannan will have built on the northeast corner of Ninth and D streets northeast. They will have press brick fronts trimmed with Otway stone. The block will cost $40,000. Architect N. T. Haller has made plans for a block of six dwellings that W. A. Coulter will have built at the southeast corner of Maple and Harewood avenues, Le Droit Park. Jos. Richardson has taken out permit for Henry Strong's new building at Eleventh and F. streets; cost placed at $45,000. Architect B. Stanley Simmons has prepared plans for four dwellings for J. H. Richards, South Capitol and O streets; two-story, built of common and pressed brick; cost, $12,000. Architect Edward Woltz has plans for three dwellings, two-story and basement, built of common and pressed brick and stone; cost, $10,000. Joseph L. McFarland will erect a store and apartment building; three-story and basement high; built of common and pressed brick with brownstone trimmings; cost, $9,000.

HEATING AND LIGHTING.

Ocean City, N. J.: Arrangements are being made to establish a gas plant.——Elkin, N. C.: T. J. Lillard wants prices on dynamos and fixtures for 15 arc and 200 incandescent electric light plant.——New Lewisville, Ark.: The Red River Lumber Company wants prices, terms, etc, on an electric plant.——Waco, Tex.: The City Council opened bids March 12 for additional street lights, and the Waco Gas Company was awarded the contract for 50 additional 10,000-candle-power arc lights, at 90 cents each per month.——Sioux Falls, Iowa.: Improvements are to be made to the plant of the local gas company.——Moberly, Mo.: Efforts are being made by Lewis R. Rumsey and others to establish a gas and electric company. It is proposed to expend the sum of $30,000.——Willingford, Conn.: The borough meeting adopted amendments to the borough charter giving it the right to do its own electric lighting. It is proposed to issue bonds for construction and operating works not to exceed $15,000.——Athol, Mass.: The Athol Gas and Electric Light Company is about to erect a $25,000 plant. For particulars address G. C. Moses.——East Portland, Ore.: An ordinance has been introduced into the City Council, providing for bonding the city to erect an electric light plant.——Chico, Cal.: The City Clerk has been directed to advertise for bids for lighting the streets for one year with thirty 2,000 candle power arc lamps.——Adrian, Mich: Bids for public lighting will soon be wanted.——New Utrecht, N. Y.: The bill providing for lighting the streets has become a law.——South Manchester, Conn.: The committee appointed by the Village Improvement Society to look into the best methods of lighting the town by electricity has decided to form a stock company. A special committee on incorporation has been appointed.

SEWERAGE NOTES.

New Decatur, Ala.: Additions to the sewerage system are contemplated.——Nashville, Tenn.: Considerable sewer work is soon to be undertaken at this place. The Mayor can furnish particulars.——Westport, Mo.: It is probable that considerable sewer work will soon be done at this place.——Galveston, Tex.: City Engineer Wilson has made a plan for a separate system of sewerage for this city.——Hartford, Conn.: Several improvements of importance are soon to be made to the local sewerage system.——Cleveland, O.: Plans are being prepared by City Engineer Force for the construction of the Broadway sewer, south of Worley street.——Newport, R. I.: The people of this place have voted a sufficient amount, and will establish important additional sewers at once.——Plainfield, N. J.: Reports say that the franchise for establishing a sewerage system at this place is to be awarded at the next meeting of the City Council.——Knoxville, Tenn.: An election has been called to take place June 18, to decide on the issuance of sewer bonds in the sum of $225,000. The plans will be prepared by the City Engineer.—— Santa Cruz, Cal.: A proposition is before the City Council for the building of two tunnels, to be used in connection with the sewer system.——Seattle, Wash.: There is a strong agitation in this city favoring establishing a system of sewers. The City Clerk can furnish particulars.—— Macon, Ga.: Mayor S. B. Price has been instructed by the City Council to call an election, as soon as possible, to decide the question of issuing bonds for sewerage operations.——Kansas City, Mo.: The Board of Public Works will soon arrange to solicit bids for the construction of the third section of the O. K. Creek sewer, which will cost about $118,000. The first two sections have already been constructed at a cost of about $90,000, though the city has not formally accepted the work. The fourth and fifth sections will not be built this year, for when the third is finished the present appropriation will be exhausted. Next year about $250,000 will be appropriated to finish the work.

WATER WORKS NOTES.

East Portland, Ore.: An ordinance has been prepared bonding the city in the amount of $300,000 for the construction of water works and other improvements.——Victoria, B. C.: A loan of $20,000 is requested by the officials for the improvement of water works.——Salem, Ore.: The sum of $50,000 is to be expended in water works improvements.——Nashville, Tenn.: The Board of Public Affairs has favorably considered the appropriation of $11,677 for the purchase of water pipe. The bill to authorize the issue of $75,000 water works bonds has passed the first reading in the Legislature.——Keyser, W. Va.: A bill is before the Legislature granting power to issue bonds for the construction of water works ——Madison, N. J.: Address Mayor James B. Albright for particulars regarding water works.——Galveston, Tex.: It is proposed to expend $1,250,000 for the improvement of the water supply.——Dundee, Ill.: The subject of water works is being discussed.——Martinsville, Va.: A joint stock company is being formed for the construction of water works.——Pana, Ill.: The question of water works will be submitted at the April election.——Tacoma, Wash.: There is talk of increasing the water supply.——Essex Center, Ont.: Property owners have decided to vote on a by-law to raise $26,500 for water works construction.——Linwood, O.: A determined effort has been started at this place towards establishing a system of water works. O. E. Walker can furnish particulars.——Jackson, Mich.: The people of this place are to hold a public election to decide the question of bonding the city in the sum of $50,000 for water main extensions. Mayor Knight can furnish particulars.——Hermon, N. Y.: A village meeting has been called to vote on a resolution to bond the town for a system of water works.——Marshfield, Wis.: The question of establishing a suitable system of water works is receiving the attention of the local officials.——Kalamazoo, Mich.: The question of water meters is being agitated here, and the indications are that the use of them will be adopted throughout the city. ——Braintree, Mass.: It is stated that if this town purchases the local water-works system from the Braintree Water Supply Company, the present owners, that numerous extensions and improvements will be made.——Palmer, Mass.: A contract has been given R. D. Wood & Co., of Philadelphia, to furnish about 150 tons of cast-iron pipe for the local water company to extend the main to Blanchardville and Water street.

BIDS AND CONTRACTS.

Portland, Ore.: Proposals will be received at the office of the light-house engineer until 12 o'clock noon on Tuesday, the 21st day of April, 1891, for furnishing the materials and labor of all kinds necessary for the erection and delivery of the Umpqua River light-house, Oregon. Plans, specifications, forms of proposal and other information may be obtained on application to the above office. Proposals are also wanted at the same office until noon on Tuesday, the 21st day of April, 1891, for furnishing all the materials and labor necessary for the construction of two keepers' dwellings, two oil-houses, barns, cisterns and draining, grading, etc., the grounds of the light-station at Umpqua River, Oregon. Specifications, drawings and full information can be obtained on application to the above office.——West Point, N. Y.: Sealed proposals, in triplicate, will be received at the office of the post quartermaster until noon, Tuesday, April 16, 1891, for the construction of the Academic Building. Plans can be seen and forms and specifications obtained at the above office, or at the office of Mr. R. M. Hunt, architect, Tribune Building, New York City.——Groesbeck, Tex.: The county commissioners of Limestone county want proposals for a court-house, not to exceed $65,000 in cost. ——Little Rock, Ark.: Proposals are wanted until April 7 for the construction of a foot, highway and street-railroad bridge over the Arkansas river. Address Hon. Jacob Erb, county judge.——Marion, Ohio: Proposals will be received until noon of April 14, by the city council of Marion, Ohio, for the construction of sewers and subsoil drains in the first district of the sewerage system, consisting, approximately, of 4,515.3 lineal feet of 15-inch sewers; 8,452.6 lineal feet of 8-inch sewers; 640 lineal feet of 6-inch sewers; 11 brick manholes; 34 sewer-pipe lamp-holes, under head of sewers; and 415.3 lineal feet of 10-inch butt-joint subsoil drain-tile; 9,092.6 lineal feet of 6-inch butt-joint subsoil drain-tile; 1,273 cubic yards of broken stone, packing for subsoil drains, under the head of subsoil drains. There will occur, in trenching for above work, 2,169.6 cubic yards of rock excavation, more or less.——Norfolk, Va.: Proposals are wanted until April 7 for the erection of the Brambleton public school. Address Geo. C. Mozer, architect, No. 125 Main street.——St. Louis, Mo.: Proposals are wanted until April 10 for the erection of a seven-story building for the School Board. Address C. L. Hammerstein, secretary Building Committee.——Dayton, Tenn.: Proposals are wanted until April 8 for the erection, etc., of the Rhea county court-house. Address J. L. McPherson, secretary Building Committee, Spring City, Tenn.——West Point, N. Y.: Proposals for the erection of a brick cavalry barrack will be received at the office of the quartermaster, U. S. Military Academy, West Point, N. Y., in triplicate, subject to usual conditions, until 12 o'clock noon on the 17th day of April, 1891, as per plans and specifications to be seen at the above office. Enclose proposals in envelope marked "Proposals for erection of Barrack," and addressed to W. H. Miller, Captain and A. Q. M., U. S. A.——Washington, D. C.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock P. M. on the 9th day of April, 1891, for all the labor and materials required for the excavation, concrete and stone foundation, stone and brick work of the basement and area walls, for the U. S. court-house and post-office building at Wilmington, Delaware, in accordance with the drawings and specifications, copies of which may be had at the above office or the office of the superintendent at Wilmington, Del.——Morgan, Tex.: Proposals are wanted for furnishing 150 tons of 12-inch cast-iron pipe, ¾ inches thick. Address J. E. Moss. ——Manchester, Va.: Proposals are wanted for putting in a complete sewerage system. Address Robt. Nelson, city engineer.——Toledo, O.: Proposals are wanted until April 2 for furnishing and erecting complete one vertical pumping engine, daily capacity 75,000,000 gallons. Address J. D. Cook, consulting engineer.——Elberton, Ga.: Proposals are wanted until April 2 for the erection of the Harris-Allen Library and Masonic Temple. Address W. A. Thomas, architect, Athens, Ga.——Centralia, Wash.: Proposals are wanted until May 7 for the erection of a wagon-bridge over the Chehalis river. Address the Lewis county commissioners.

Durham . System . of . House . Drainage.

Silver Medal Awarded in 1883 to the Durham House Drainage Company, of Chicago.

E. BAGGOT, Chicago.

OFFICE & SALESROOMS: 169 & 171 Adams Street,
BRANCH: 2134 Michigan Avenue, - - -
FACTORY: 367 & 369 Illinois Street, - -

P. V. Dwyer & Bro., St. Paul.

Durham Sanitary Engineering and Construction Co., Minneapolis, Minn.

Hussey & Day Co., Omaha, Neb.
Henry Paul, Houghton, Mich.
J. D. Madden, Fort Wayne, Ind.
J. M. Toye, Winona, Minn.

Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

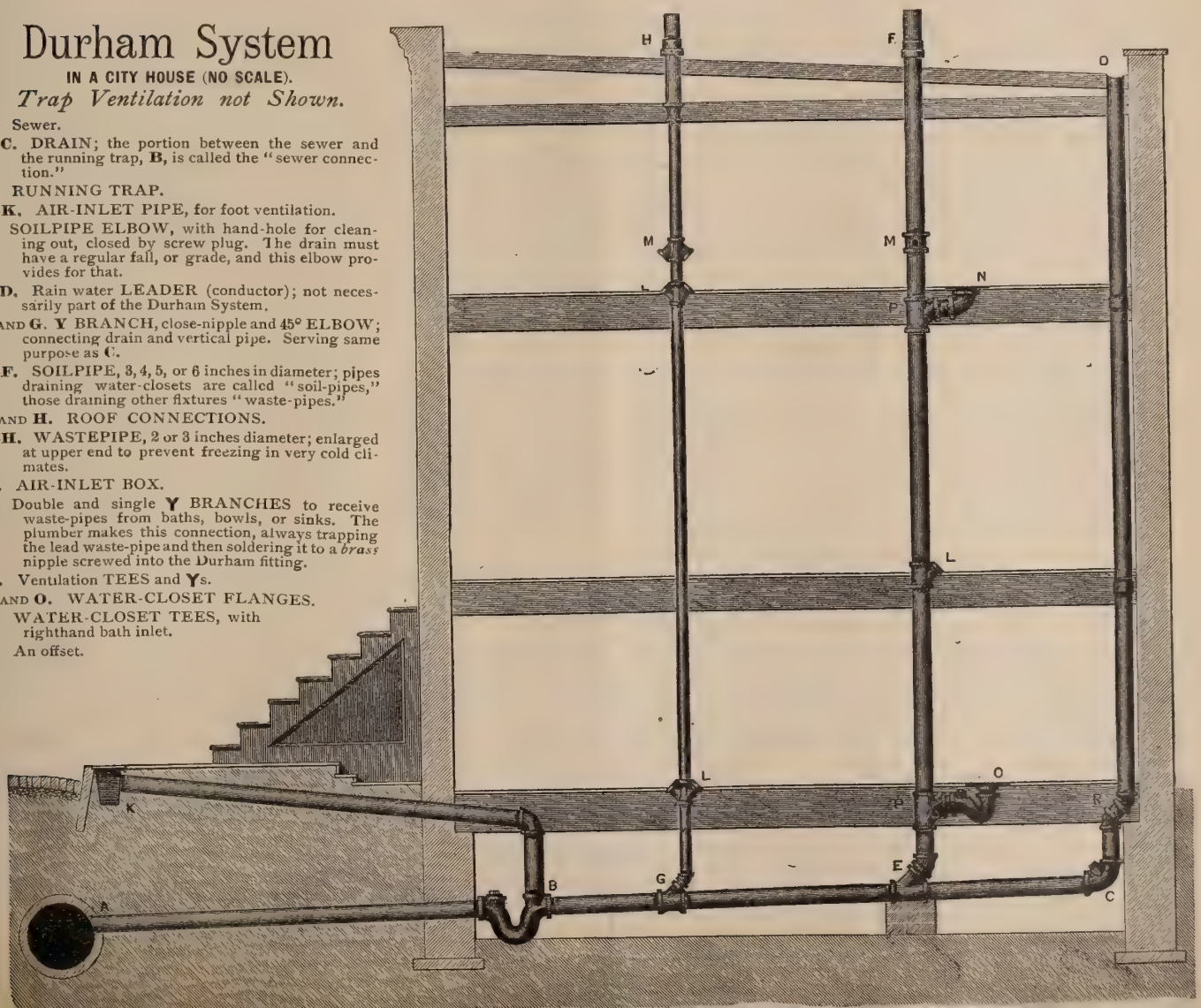
L. Double and single **Y** BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventulation TEES and **Y**s.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



Geyser! Tidal Wave! Tempest!

BOYLE'S PNEUMATIC CLOSETS

are in use in all parts of the United States and have gained a high standard of merit on account of their simplicity and cleanliness.

All our sanitary appliances may be seen in operation at our show rooms.

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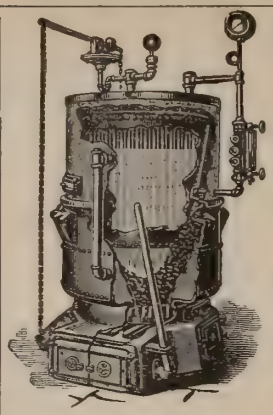
THE CLIMAX

GAS MACHINE AND GAS MIXER

is the most perfect, most successful and most complete Gas Apparatus known. An absolutely smokeless and clear gas is the invariable result of its use, and plain lava tip burners are used, obviating the use of Argand or other adjustable burners necessary with every other make. All kinds and sizes of buildings are lighted with it, and full satisfaction is guaranteed. It is made in a variety of sizes and shapes to suit the existing conditions. For can and tinware manufacturers, packers, &c., a special apparatus is made for producing a gas of intense heat at a cost not exceeding 30 to 40 cents per 1,000 cubic feet. Catalogue, testimonials and full information free on application. **CLARENCE M. KEMP, Baltimore, Md.** We protect the trade and want live, wide-awake agents everywhere.



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"Perfection in Modern House Heating."

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The position of the coal pockets is such that the reservoir can be as easily filled as an ordinary kitchen range. Hundreds in use, giving entire satisfaction. Our new book on Modern House-Heating, furnished on application.

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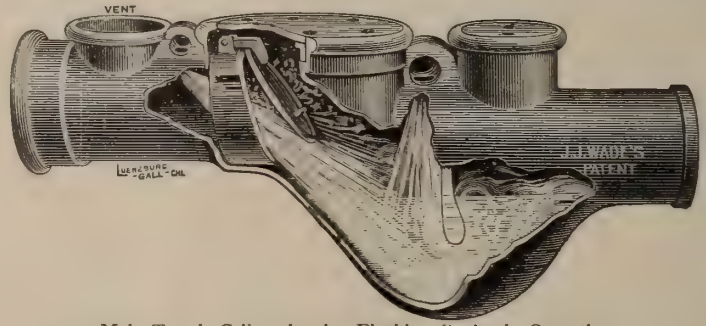

Main Trap in Cellar, showing Flushing Device in Operation.

THE WADE PATENT FLUSHING FITTINGS

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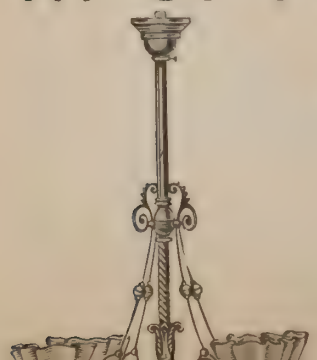

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SALUTATORY.

To my friends, whether plumbers, manufacturers, dealers, doctors or sanitarians, and any and every one who believes in healthy and happy homes:

Having been elected president of THE SANITARY NEWS Publishing Company and general manager of this journal, I, in assuming the duties imposed upon me, desire to address the following to all persons associated in the great and important province of this journal and the vital interests to which it is devoted:

THE SANITARY NEWS recognizes and fully realizes the importance of the plumbing interest in connection with the sanitary condition of cities, as well as the propagation of sound sanitary doctrine. Hereafter, as heretofore, its columns will be devoted to urging the enactment of such legislation as will fully protect the public health, and result in the abatement of such nuisances as tend to imperil the well-being of communities; to pointing out the necessity of such action as will insure a sanitary exhibit at the approaching World's Fair that shall be an illustration of the progress made in this direction during the past decade; bringing into its columns such discussion of sanitary subjects as shall prove profitable, instructive and interesting to all of its readers. It will, in fact, labor earnestly in the interest of the trade at all times and places, and under all circumstances. New features will be added from time to time, making the publication interesting and indispensable to the plumber, his wife, his daughter, or his sweetheart. No pains or labor will be spared to make THE SANITARY NEWS a welcome visitor in every office and household. Its high editorial standard will be maintained, and nothing will be left undone in the consummation of which its patrons may be pleased and edified.

I need not say to my old friends of the past that I shall be more than pleased to hear from them at all times upon subjects affecting the welfare of the craft and of the community at large. The latch-string will be out at our office continually, and all will be heartily welcomed.

Reports of plumbers' meetings will be given prominence in our columns; the advancement of sanitary science, co-existent with our organization, will be promoted by every means in our power. Efforts to educate the people to a proper appreciation of the importance of scientific sanitation will be unremitting, and no effort will be lacking which shall seem to tend toward the elevation of the profession and its just recognition by the public at large, as well as by municipal and legislative bodies. In this work we ask the hearty co-operation of all members of the craft in every part of the country, feeling confident that they will be fully repaid by an increased public interest in, and appreciation of, their work. At the same time we hope, by the dissemination of intelligence of whatever may concern the welfare of the craft, to materially assist in increasing the efficiency and usefulness of the profession, and to broaden the sphere which it is destined to occupy. We hope to see the promises of the present more than fulfilled in the realization of the future, and to that end we shall direct all our energies.

Respectfully, ANDREW YOUNG.

IMPORTANT ANNOUNCEMENT.

A new feature in THE SANITARY NEWS which will be carried through a number of issues, will be commenced next week. This will consist of a history of the different Master Plumbers Associations of the United States, which will embrace a history of each association from its organization to the present time, the portraits and life sketch of the presidents of the associations, the present officers and committees, list of members, the status of trade protection, dealers who have signed agreement, registration system, and rules and regulations governing plumbing, building, plumbing and sanitary inspection, and matters of interest connected with plumbing in the different cities and every Master Plumbers' Association in the country. A letter was addressed last month to every local association asking for the matter above mentioned and the responses received are sufficient to warrant an interesting series of articles which, in their entirety, will give a very full history of these associations, and of related matters which will be of value not only to plumbers, but to the public generally. The object in collecting and publishing this matter is to present to the public a train of evidence establishing the progressive character of master

plumbers in an organized offort to advance scientific plumbing and render effective the beneficient offices of sanitary science.

The Sanitary News having a wide circulation outside of the plumbing fraternity as well as in it, it is an available medium through which to present to the public the importance and value of the plumbers' work, the high rank they have attained in sanitary progress, and their rightful claims to public and official recognition. This matter cannot fail to be of interest and value to municipal authorities, boards of health, and all others officially or personally interested in sanitary reform, the great majority of whom are readers of The Sanitary News. The articles will also present a collection of the plumbing regulations of the different cities, afford a means of comparison, call forth discussion and tend toward the selection of the best from all, approaching uniformity in practice and plumbing laws, resulting in a model regulation of this most important branch of public and domestic sanitation.

Next week's issue will contain the first of these series of articles, the Rochester (N. Y.) Association, Mr. W. G. Reid, president. Other associations have forwarded similar articles which will be published from time to time until the histories are complete.

We wish in this connection to request the presidents of associations who have not yet responded, to let us hear from them, as we wish to give a full and interesting account of each association. The matter will be worthy of preservation by every master plumber and will have a good effect on the public at large. We desire the aid of the members of every association in this matter, and feel assured that the result will be beneficial and well repay the time and labor necessary for the consummation of the undertaking in the attainment of the end in view.

When building owners learn that the best plumbing is the cheapest, there will cease to be a premium on bad plumbing.

There is a relation existing between a small plumber's bill and a large doctor's that would repay careful investigation.

A dwelling is made to live in, to be comfortable, happy and healthy in, and it fails in its purpose if not constructed so as to fill every office man's most perfect enjoyment requires.

There is more real value in a properly plumbed building than there is in the most elaborate and ornate stone front.

Good plumbing adds as much value to property as bad plumbing detracts from the possibilities of perfect health.

Last fall a meeting of the citizens of Pottsville, Pa., was held to protest against the bad sewerage that was suffered to exist there. The council took no heed of this protest and refused to comply with petitions praying for an improvement of the sewerage system. The council is now being very severely censured for its neglect, which has resulted in such a pollution of the water that an alarming extent of sickness prevails, which is attributed to the drinking water. A chemist of Philadelphia having made an analysis of the water, pronounced it unfit for drinking. Thus from the criminal neglect of the council the country about this place suffers the visitation of an epidemic. This is one more lesson among many teaching the value of proper sanitary measures, and illustrates how a dull town council can call down upon the people the miseries of diseases which could have been prevented.

Those who look on plumbing as being merely mechanical, and think that any good mechanic can do good plumbing work, do not know anything about the matter. The fact is a job of plumbing may be perfect mechanically and most defective and dangerous sanitarily. The plumber who does good work must of course be a good mechanic in his line, but he must be a good deal more. He must understand and know how to apply the scientific principles on which all plumbing is based. Here is where the value of plumbing rests. Embracing these two qualities, the plumber is the most important agent in building construction. The painter, the decorator, the mason, the carpenter, and all others may do bad work without endangering health and life, but the plumber must leave his work perfect to avoid subjecting the home to all the evils and disease that attend defective drainage.

On next Monday evening the ordinance regarding plumbing inspection will come up before the Council. The matter has been fully presented and the necessity for the provisions of the ordinance clearly shown. At present there are but ten plumbing inspectors. Counting the average liability of sickness through the year, the force is reduced to about eight inspectors actually at work. Just now, during the presence of the prevailing epidemic, the Chief Inspector has but six inspectors able for duty. No one would suppose that the full force of ten inspectors could attend to the work in this line in a city of 1,200,000 population. The ordinance provides for fifteen additional inspectors, making twenty-five in all, of practical plumbers. Experience and the demonstration of every-day work clearly show that public interest demands this. The people can be no better served than when the sanitary conditions of their homes are properly secured, and the Council can discharge no higher duty than that of promoting and maintaining the health of the people.

It is claimed by some who do not know, and do not take the trouble to inform themselves, that the object of plumbing regulations, plumbing inspection, registration and the like, is to drive the smaller plumbing shops out of the trade and out of competition, and that such regulations are solely in the interest of the larger firms. This is an error, for there is not a line in any plumbing ordinance or regulation that operates against any reputable, qualified plumber, whether he is doing business on a fifty-dollar capital or on a capital of fifty thousand. There may be men working at plumbing against whom such regulations would operate, and the sooner such regulations are effective in driving such men out of the trade the better it will be for them and the public at large. These regulations demand only what the best scientific and practical minds have demonstrated to be the best in the science and art of plumbing. They do not throw a straw in the way of the qualified plumber, nor do they prevent any one from becoming properly qualified to do this important work. If a plumber is qualified to do good plumbing and will not do it, he should be made to do it or quit, and if he is not so qualified he should not be allowed to attempt it. That is all there is of it, and there is nothing in such regulations favoring the larger plumber or prejudicial to the smaller. All have an equal chance. The laws are enacted in the interest of the public in the promotion of health, and to secure this it is highly necessary and proper that none but the qualified should be permitted to do plumbing work. If in securing this laudable object, the reputable qualified plumber is incidently benefitted so much the better, for the public is multifold the gainer thereby.

PLUMBING AND THE PUBLIC.

Whatever affects the general welfare is of public interest, of however a personal or private nature that may be. Whatever affects the public must be controlled by the public in order that evils may be avoided and the greatest good obtained. There is no individual or private enterprise that touches the public interest that is not governed by statutes provided by the people for self-protection. Were it otherwise, private undertakings fraught with the gravest dangers to the public safety could be engaged in without any means of prohibition. Dynamite could be manufactured in the streets of our most populous cities, and every evil, nuisance, or menace to public safety could exist wherever private interests, reckless, malicious, or selfish motives might dictate. It is through public control and regulation of whatever is of public concern that affords all the protection people have from the worst forms of every evil that human ingenuity could suggest or human effort produce.

That plumbing is distinctly of direct public interest is a fact that all should recognize, but unfortunately there are a great many who regard it of private interest, concerning only those who pay for having the work done. Such claim that it is their right to do what they please with their own property, and that it is no body's business what kind of houses they build, what color they paint them, how high they build them or what they are made of. Such claims are true only where man is isolated and lives wholly apart from all mankind. In communities no individual lives for himself alone. His "rights" in everything is no more than that which he can pursue without injury or discomfort to his fellow-

men. Were it otherwise, such a thing as communities would be impossible. The principle, moreover, is destructive of all rights; for if each individual were suffered to do as he willed, seek to exercise all the rights he might proclaim for himself, there would be no rights at all, for each would trespass upon and destroy the others.

The existence of governments and the possibilities of communities depend upon the public regulation of private affairs that effect the general welfare. Municipal authorities are led to the necessity of regulating building, traffic, business pursuits and everything that tends to build up a city in order that it may be stable, of necessary uniformity, pleasing, and safe. All purposes which might be considered "personal rights" outside of communities, become common interests when individuals form a congregation.

The nature of plumbing is such that it cannot in any sense be considered of such private concern that it is beyond the necessity or right of public regulation. If plumbing stood in the same relation to domestic economy and public welfare as decoration or upholstery does, then the choice of the individual might not be disputed. But there is a vast difference. Plumbing touches the health and life of humanity. No man has a right to poison his family by putting arsenic in their food; and no more has he the right to poison them by having constructed a plumbing system that will admit noxious gases and disease germs. But this is not all. The family is not the only ones subjected to the dangers of defective drainage; but the entire community is menaced by the unsanitary condition of one household. There are many cases on record where fatal epidemics have originated from a single sewage polluted well. One illy-plumbed house in a community can easily become the source of an epidemic that will spread throughout the city or village. Sanitary science may not yet have risen to the heights demanded for perfect conditions of health, but the nearer it attains to the perfection of sanitary drainage of each separate building, the nearer it will approach these heights and meet the demands of hygienic laws.

This purpose great as it is, immense as the undertaking may seem, is the soul and spirit of the Master Plumbers' Association. It is so defined in their constitution, and the great strides the association has taken in this direction evidence their aim to accomplish this and demonstrate their ability to do so. They entered upon this undertaking confronted with public apathy, indifference, ignorance, and all the opposition that results from these. But despite all this, so rapid has been the progress that in many of our cities to-day stand side by side buildings which illustrate the defective system of the old and the perfection of the modern method of plumbing. So great has been the advancement that these two classes of buildings, which represent a decade of architectural progress, illustrate a century in the advancement of plumbing. Yet, despite this, ignorance and indifference still exist and cry out in opposition to laws and ordinances regulating a matter of such direct public interest. There is probably not a law or ordinance governing plumbing in existence that was not originated and passed by the efforts of plumbers, and not one such law or ordinance exists that is not of direct public benefit. The further promotion of this reform is one of the foremost purposes of the master plumbers' association, and to this public support should be most unreservedly given.

NOTES AND NEWS.

The sum of $40,000 has been given to McGill University by W. C. McDonald to establish a chair of electrical engineers.

The Board of Health of New York City has addressed the Mayor with reference to the proposed roofing over of the Bryant Park Reservoir, requesting him to take steps to defeat the project.

When cast and malleable iron are used in the same structure a galvanic action is set up between them, and the malleable iron is corroded.

Experiments tends to show that the edges of the flame of a petroleum lamp give from 37 to 38 per cent less light than the flat surface.

Cork covering for steam pipes has proved very successful in England, and in some cases it has been found to make a difference of 100 to 124 degrees from the temperature of uncovered pipes.

Niagara Falls is to furnish power for an electric railway for which Rochester capitalists are endeavoring to obtain the right of way. The proposed road will be more than eighty miles long.

According to statistics in the *Locomotive*, published by the Hartford, Conn., Steam Boiler Inspection and Insurance Company, the total number of boiler explosions during 1890 was 226, against 180 for 1889. There were 244 persons killed and 351 injured.

A party of engineers is being organized and equipped at New York to start about April 1 for the Isthmus of Panama, which they will cross, and proceed down the Pacific coast to Ecuador. There they will run preliminary locations for the proposed intercontinental railway between North and South America.

The man who observed that the largest rivers generally happened to run close to the largest cities, has now discovered that the firms that do the largest amount of business generally happen to have the largest advertisements in the papers.—*Danville* (N. Y.) *Breeze.*

Japan had a plethora of epidemics during 1890. Influenza reached her shores in February. Cholera followed with over 31,000 deaths. Dysentery affected 38,878 persons, with 7,262 deaths, a ratio of 18.94 per cent. Typhoid fever occurred 22,784 times, with 5,369 deaths, 23.56 per cent.

To ascertain whether an article is made of steel or iron pour on the object to be tested a drop of nitric acid 1.2 specific gravity, and after it has acted for one minute rinse with water. If iron, the spot will be of a whitish gray color; if steel, it will appear as a black stain.

An insurance man of long experience declares that milk is the best obtainable extinguisher for a petroleum fire. If milk is not at hand flour will answer nearly as well for putting out the flames. Put your low grade up in small neat packages, and mark it Petroleum Fire Extinguisher.—*American Miller.*

The quantity of water used for extinguishing fires in London during the year 1890 was between 20,000,000 and 21,000,000 gallons, or about 92,000 tons. Of this quantity about 8,000,000, or about 40 per cent. of the whole, was taken from the river, canals, and docks, and the remainder from the street pipes.

A movement has been started to honor the late Captain James B. Eads, by erecting in the city of St. Louis, Mo., a fitting monument commemorative to the life work of the great engineer. The Eads Monument Association, with headquarters at St. Louis, has been organized, and subscription blanks have been sent out to engineering societies in different parts of the country.

Soft oolitic limestone, or limestone with spherical granules, is now hardened into marble by treatment with a certain chemical solution, which gives the stone a thick, strong skin about half an inch deep, capable of a fine polish. Soft oolitic can thus be worked into any form and hardened afterward. The marble becomes impervious to damp and atmospheric influences.

A great many people are interested in knowing how to remove oil marks on wall paper, where careless people have rested their heads. This may be done by making a paste of cold water and pipeclay or fuller's earth, and laying it on the stains without rubbing it in; leave it on all night, and in the morning it can be brushed off, and the spot. unless it be a very old one, will have disappeared. If old, renew the application.

Herr Gustav de Laval, Swedish engineer, has a new method of imparting a very high temperature to metals by means of electricity. He has constructed a box of fireproof material through which runs a narrow channel open at both ends, but which, in order to facilitate the flow of the molten mass, is wider at one end than at the other. At each end poles for the introduction of the electric current are fixed, so that the latter passes continually through the molten metal as it flows through.—*Iron.*

It must be remembered that $1 a pound aluminum is really not so high as it looks, for the relation of a pound of aluminum to a pound of other metals is something like that famous pound of feathers to the pound of lead. Aluminum is almost three times as bulky as iron, weight for weight; it is nearly four times as bulky as silver and more than seven times as bulky as gold.

Thus, if silver were $1 an ounce and aluminum $1 a pound, silver would be really fifty times more costly, bulk for bulk; aluminum at $1 a pound would only be twice as costly as copper at 15 cents a pound.—*Bradstreet's.*

With regard to the candle-power of electric incandescent lamps, *Industries*, of London, recently remarked that the usual way of measuring an incandescent lamp with a photometer is very much in its favor. An 8-candle power lamp, it pointed out, gives 8 candles in a horizontal direction only, and sometimes only in one horizontal direction if the filament be flat. In a vertical direction the light may be only 2 or 3 candles. The mean light in all directions may be much less than 8 candles. As to the light-absorbing effect of lamp bulbs, our contemporary remarked that it is surprising to note what a large percentage of light is wasted by an almost imperceptible blackening or external soiling of the bulb.

The *American Engineer* gives the following method for uniting lead pipes: Whatever the size of the pipe may be, procure a block of hard wood, say four or five inches long and four inches in diameter, bore a hole straight through the center so nearly the size of the pipe that the block can be driven on the end of the pipe with a light hammer. If one has a set of auger bits, it will not be difficult to select a bit of the proper size to make a water-tight fit. Let the block be driven clear on the pipe so that the end of the pipe will be flush or even with the end of the block. Now place the two ends of the pipe together and drive the block off one pipe on the other until the joint will be at the middle of the block. If the whole in the block is made of the proper size, the block will fit so closely that the joint will be water-tight; and if the ends of the pipe are dressed off true and square the joint will be so strong that it will sustain the pressure of a head or column of water one hundred feet high. Iron pipe may be united in the same manner. Should the joint leak a trifle, let shingle nails be driven into the wood around the pipe so as to press the timber firmly around the pipe.

USE OF GALVANIZED IRON FOR ARTESIAN WELLS AND FOR THE CONVEYANCE OF DRINKING WATER.*

(Continued from page 247.)

An interesting paper on the use of zinced or galvanized iron for the storage and conveyance of drinking water was contributed by Dr. W. E. Boardman, of Boston, to the Fifth Annual Report of the Massachusetts State Board of Health, 1874, the object of which was stated to be to determine, if possible, whether such use of this material was attended with danger of zinc poisoning, this having been asserted in the Boston *Journal of Chemistry*, in commenting upon cases of illness occurring at Spot Pond, Melrose, Mass., in 1871.

To this paper I refer as concise statement of the opinions of numerous distinguished authors from 1795 to 1872.

"From this *resume* of opinions and facts," says Dr. Boardman, "it may be confidently asserted that the oxide of zinc *as it occurs in drinking water* is absolutely harmless."

With regard to the carbonate of zinc, he says: "The almost universal testimony appears to point conclusively also to the innocuity of this compound."

The above conclusions are in regard to that which is in suspension only. As regards the effects of zinc in a soluble form, Dr. Boardman says: "Admitting, then, that water which has been stored in reservoirs or drawn through pipes of galvanized iron always contains zinc in solution in the form of one or more of its salts, the innocuity of those salts *in the quantities in which they occur* is attested by the experience and experiments of the various distinguished observers to whom we have already referred. While they admit the deleterious influences which may be occasioned by the soluble salts of zinc when taken internally in sufficient quantity or for a long time, they are unanimous in the recommendation of the use of zinced iron for the storing and conveyance of water." [*The italics in the above quotations are the writer's.*]

In most of the cases considered only a very small amount of zinc was found in solution; and Dr. Boardman expressly states that he does not include in his consideration the effects of waters obviously unfit for drinking on account of sewage pollution or other abnormal qualities.

Dr. Boardman, in the above-mentioned *resume*, has followed the older writers on *Materia Medica*, but since the publication of his paper opinion seems to have become somewhat modified.

Dr. Bartholow, in his work on *Materia Medica and Therapeutics* (3d ed., 1880, p. 229, *et seq.*) says of the physiological action of the salts of zinc: "The preparations of zinc are active in proportion to their solubility and power of diffusion. The chloride sulphate and acetate are the most active, and in the order in which they are placed; the carbonate and oxide being insoluble have very feeble diffusive power and possess consequently very slight activity."

"Long-continued use of the sulphate, even in small medicinal doses, may excite ulceration of the mucous membrane. The oxide and carbonate, although insoluble and inactive, slowly produce systematic effects."

"All of the salts of zinc when long continued may produce a train of symptoms not unlike those caused by lead, viz: Emaciation, pallor, loss of strength, constipation and colic, muscular weakness and trembling, paralysis, etc."

"The oxide in large doses and used for a long period has produced wasting and fetid breath, gastro-intestinal catarrh, weakness and feeble mind."

"The zinc salts manifest much less tendency to accumulate, and are excreted much more rapidly than mercury, lead and copper."

The symptoms above described by Dr. Bartholow are, of course, to be understood as produced by very much larger quantities of zinc than ordinarily occur in water. Nevertheless, the older opinion of the almost absolute innocuity of the more insoluble forms appears to be seriously questioned, and our sense of security is correspondingly somewhat disturbed.

That zinc may also occur in a soluble form in drinking water in quantities which may be almost called medicinal is shown by the analysis of this artesian well water. It is now well known that, as regards lead, the long continued daily use of water containing a small fraction of a grain of the metal in a gallon has had distinctly marked effect upon the system, and the chemist is advised to condemn a water carrying more than one-tenth of a grain per gallon. This is largely in consequence of the cumulative power of this metal. Zinc not possessing that power in so great a degree is proportionately less injurious.

It is true that large communities have been accustomed to drinking water slightly contaminated with zinc without any effects being apparent that could be attributed to it. Thus we may instance a large experience in this city and vicinity.

And, again, I find in *The Analyst* (vol. iv, p. 51), an abstract of a paper by E. Hylius, in which he says that the presence of minute quantities of zinc does not seem so injurious to health as is generally believed. That author analyzed a sample of spring water from Tuttendorf, in Germany, and found it to contain 0.007 grams of zinc oxide per liter equal to 0.49 grains per imperial gallon; and he was assured that the water had been drank by the population for about a century.

This sort of evidence is, however, not conclusive by itself, for many obscure symptoms which may really be caused by small amounts of metallic poisons are liable to be attributed to a variety of other causes. The same argument may be used with regard to a public water supply from a river decidedly polluted with sewage. In the absence of an epidemic, it is often very difficult either to prove or disprove the precise deleterious effects of a sewage polluted water supply on the population of a large city.

In the same manner it has been shown that in the case of a town in Scotland, supplied with water containing a very large amount of sulphate of lime, the inhabitants did not appear to suffer any injurious consequences from drinking such a water. Yet it is a well-established opinion among sanitarians that excessive amounts of sulphate of lime in drinking water are undoubtedly productive, as a *general fact*, of diseases of the digestive organs.

Still it must be conceded that the weight of practical opinion is decidedly on the side of the innocuity of the use of galvanized

*By Ruben Haines. Reprinted from the Journal of the Franklin Institute. *Architecture and Building.*

iron for water pipes. Thus, as a result of a discussion at a meeting of the German Society of Gas and Water Engineers, H. Bunte collected in 1887 information to show that the use of galvanized pipes should be in no way detrimental to health. Dr. V. Ehmann, late Director of the Water Supply of Wurtemburg, stated that objection to such pipes cannot be taken on sanitary grounds, and he considered them peculiarly suitable for use in the interior of buildings.

English authors on sanitation have always been opposed to the use of zinc for roofs which are to be utilized for the collection of rain water for drinking and culinary purposes.

Neither should lead or lead-coated sheet iron, called terne plate, for roofing purposes be used under such circumstances. Sheet copper is equally objectionable. All these metals or metallic combinations, if unprotected by a suitable paint, will be corroded by the free acids frequently found in the atmosphere of rural localities as well as of cities; and, also, by the ammonia always more or less present in rain water, which exerts a solvent action upon copper. The corrosion of copper by the impurities of rain water is known from practical experience with copper-roofed buildings in Europe.

In conclusion, therefore, it may be said that while under usual conditions of water-supply with pure water galvanized iron pipe may be advantageously used for its conveyance without detriment to health; yet too much confidence should not be placed upon it. All the conditions under which the zinced pipe is to be used should be carefully considered, including a chemical analysis of the water; and, in the presence in the water of considerable amounts of certain saline substances, such as ammonia salts, chloride of sodium and nitrates, as well as very small amounts of free mineral acids, etc., galvanized iron should not be used at all. Under such circumstances only pipes coated with a non-metallic interior surface should be used.

THE PRINCIPLES OF SANITARY DRAINAGE.*

Gentlemen: In 1863 I had the pleasure and the pain—the latter I have occasionally with me yet—of serving our venerated and respected "Uncle Sam" as a soldier.

Having been ordered to operate against the guerillas and bushwhackers on and along the Big Sandy river in Eastern Kentucky, one day on our march we stopped at the house of a farmer, and of course made inquiries of the usual kind for the business we were engaged in, winding up with the question, are you a Union man? The old gentleman was slow of answer, but finally said: "Well, Yanks, I hain't got no book larnin', but I'm for the old Constitution, anyhow." And no amount of pressing on our part could move him from this answer. Gentlemen, I am like the Big Sandy farmer. I "hain't got no book larnin'," and what I have to say to you in regard to drainage, plumbing and ventilation is the conclusion arrived at in a lifetime of practice, aided by honest and fairly intelligent observation.

Let us consider for a moment the essentials of a perfect system of house drains. The house drains are intended to carry away from the house all liquid refuse, waste or surplus water and foecal matter; and in doing this, they should be so constructed as to prevent the generation and the entrance of sewer air into the building. The first condition would require that the drain throughout should have sufficient declivity towards the discharge into the sewer to enable the liquids and solids contained in it to maintain a constant and uninterrupted motion, so that stagnation shall never occur.

Second, that the entire length of the drain should be so constructed and maintained in a condition of complete impermeability so that no portion of the matter put into it shall escape accidentally from it.

Third, that the head of the drain should be so efficiently trapped and ventilated that any gaseous products arising in it may be carried off and discharged above the roof; and,

Fourth, that the lower extremity of the drain should be so completely and durably formed that no interruption to the flow of the drainage or escape shall there take place, and that no facility shall be offered for the upward progress of sewerage in case the sewer become surcharged and thus tend to produce such an effect.

These considerations, simple as they are, may be regarded as self-evident necessities. Yet, from long acquaintance with the details of this work as heretofore regulated, reveals the fact that they have been generally neglected, and that in many houses the work has been universally crippled by the consideration of cheapness in first cost, at the expense of permanent economy and usefulness.

Drainage and waste pipes should never be buried beneath the floor of a cellar, nor should they be built in the walls above the cellar where it is possible to carry them up through closets or in wooden casings, and cast-iron drain pipes should always be used within the walls of the house. Between the house and the street sewer stoneware pipe may be laid on a well prepared foundation, and under no condition should they be allowed to enter the house, even when laid in cement, the best stoneware pipe, full of cement joints as they must be, though buried beneath a cement floor, are liable to, and frequently do, after short use, give off an amount of stench that can be easily perceived and is dangerous to health. Lead soil pipes are objectionable being easily perforated by the careless driving of a nail or being gnawed by rats and as liable to be broken by their own weight when run to any great height, or from the settling of the building. The objection urged against the use of iron pipes, that they are liable to rust out from the inside, is invalid, since they soon become coated with a greasy film which prevents corrosion, and if properly coated with coal tar when hot, will last as long as desired. The joints of the iron pipes should be thoroughly calked with lead, and right-angle connections should be avoided except in vertical pipes. The small wastes from baths, bowls and sinks should be of lead which is a very suitable material.

A proper and safe joint between lead and iron pipes is made by the use of a tinned brass ferule soldered to the lead pipe; this slipped into the hub of the iron pipe and thoroughly calked with lead, makes a safe and durable joint and will last as long as the pipe itself. Every vertical line or stack of soil pipes should extend through the roof of the house and in size at least four inches in diameter, and extend far enough above the roof to prevent its being filled with snow. Our rules require the enlarging of all vent pipes passing through the roof, the purpose being to prevent their being closed by heavy hoar frost in cold weather. With this arrangement a constant draught is maintained through the house drains, the air entering at the vents on sewer outside of building and passing up through the vents at roof; the temperature of the house in winter is always enough above that of the outer air to sustain this draught. In summer the sunshine on the upper ends of the vents of roof will aid it, for the hole at the lower end being at or below the surface of the ground where the air is dense and cool, will aid in producing the upward draught desired. This upward current is reversed for a moment only whenever any considerable charge of water is emptied into the drains from the upper stories of the house, for the water pushes the air down as it falls and other air takes its place from the upper end of the pipe. If both these openings are not kept open, trouble will be sure to follow the use of the drains, for the water rushes down the vertical pipe with great velocity, and if it nearly fills the pipe it acts like a piston to drive all the air in advance. If the free escape of this air were not provided for by the fresh air inlet at or near the curb wall, the result would be to unseal the traps in the fixtures in the lower part of the house.

The arrangement described is essential to every house, for by this means every part of the main drain is not only kept in accord with the normal atmospheric pressure, but is also swept by a constant current of air. Smaller branch wastes from bowls, baths, etc., can connect or discharge into the soil pipe on the street side of closet trap, but each branch should have a vent to the open air and separate traps as called for in rules and shown on plans of the Health Department. Without such ventilation for each branch the discharge of a few gallons of water through any of them wil be likely to empty some or all of the traps that connect with it by syphonage. Or, the discharge of water down the vertical stack itself, will often produce this effect by the friction between the descending water and the air in the branch pipe at the junction. It is always best from each bath or bowl to carry the pipe separately to soil pipe or drain, for if these branches were to connect with one another before connecting to soil pipe, the flow

*Lecture delivered by Chief Inspector Andrew Young before the graduating class of the Chicago Medical College on the evening of March 25, 1891.

through one would be apt to disturb the air in the other, and thereby destroy the seal in the traps.

It was a common practice for years past to lead the waste from bath and bowls, etc., into the water closet trap below the water line, and thousands of houses in this city have been connected in that manner. The evil results of such work are shown upon the discharge of warm water from bath or bowl, the heating up of contents of the closet trap composed in part of foecal matter, and the steam and odors arising therefrom are very likely, by their expansion when so heated, to find some crack by which they can penetrate into the rooms; or a slight sagging of the pipe, or a tipping of the trap itself—which sometimes occurs—in time will throw the connection above the water line and afford free egress to the room for the fumes.

Another defect in this method of connecting wastes is the long length of pipe from the seal, and the filth that would gather in the pipe and by contact with the air when not in use, would give forth its ordors into the room, but in the drainage of a house in the manner I have described, all pipes vented through the roof affords a ready escape for all sewer gasses and relieves from pressure all the traps and the various parts of the drainage throughout the building, furnishing air behind sudden discharges of water from the closets for the preventage of syphonage.

The size of drain pipes should be graduated according to the quantity of sewage to be passed through them, limited in the minimum extreme so as to avoid stopping from the excessive bulk of the sewage matter, and in the maximum extreme so as to obtain all the rapidity of progress of which a small stream is capable, retarded by the friction of the surface over which it passes. For moderate sized houses, say of eight rooms with five or six of a family, five-inch pipe in diameter would suffice for the house drain, while six inches with a proper fall would suffice for the largest residences.

TRAPS.

These devices all depend upon the principle, viz., a depression or chamber is made in the drain or pipe in which water is retained forming a seal to prevent the passage of gasses or air; since it is desired to retain as little of the sewage as possible within the drains, the smaller the chamber the better, provided it is efficient and can be relied on to retain enough water to form a seal.

The simplest form is the S trap. This form with its smooth interior and graceful curves is not likely to become a place of deposit for the grease or other solid matter in the sewage, and if it could be relied on to retain its water it would be the best form because of its cleanliness.

When not vented, however, it is liable to lose its seal by syphon action whenever the waste pipe runs full below it, or whenever any slight vacuum is produced in a connecting pipe into which it may be discharged. The remedy for this is to admit the atmospheric pressure just below the water seal by a vent pipe; this, if of proper size, will be found to be efficient. It may be admitted that any trap will in a greater or less degree be an obstruction to the flow of the water, and that there is danger of sewage deposits lodging in them and consequent decomposition of such deposits; but if frequently used and properly vented the danger will be very slight. There are numberless traps in the market called mechanical traps, and many forms and methods for closing the opening by a solid valve to stop the passage of gasses in the direction opposite to the flow of the water, and if the fluids passing were clean and free from solid matter they might be satisfactory, but this not being the case, the result is that the valve seat becomes the place of deposit of lint, hair, grease, etc., which adhere to it and prevent the appliance from closing tightly. It is claimed by the patentees of these devices that the simple S or P trap is capable of passing gasses by the solution or absorption of such gas in the trap water, to be given off on the other side into the air in the room; but experiments by Dr. Carmichael, of Glasgow, show that in practice this transfer is not likely to occur, unless the concentration of foul gas becomes much more marked than is likely to be found in sewers with even moderate breathing places, nor does the transfer of germs or spores however minute take place.

Water closets are one of the necessities in every properly appointed house. In the market there are many forms, some utterly bad while others vary in degree. The Pan closet—its use is now prohibited in this city—in new buildings is probably the worst by reason of its inaccessible fouling space. (The different traps and water closets were here shown and their merits and demerits explained.)

In conclusion I would say, do not underrate "book larnin'," for books will stimulate you to investigation, investigation to discovery, and discovery to the truth.

THE PLUMBER'S TRAP.

A plumber one day went out to plumb
In the morning fresh and fair;
For he knew disease was in the land
And death was in the air.

He paused in front a mansion tall
With its outward gleam of pride;
But sorrow cast its gloom within,
For the family joy had died.

"I'll try my skill where drugs have failed"
Quoth the plumber with content;
For diseases he had baffled oft
With his well-planned trap and vent.

He tore away the rubbish there
With many a bang and rap,
And skillfully set secure and fast
His tried and tested trap.

He knew the ways of unseen foes
That the health of mankind sought,
So he set his trap with utmost skill,
And this is what he caught:

A puff of air from the sewer there,
With typhoid fever germs;
And the bicillus that seeks to kill us
And microscopic worms;
The poison of sinks with noisesome stinks
And the closets breath of death,
And sewer gas that sought to pass
With deadly germ-fraught breath.
There was cholera seed and germs that breed
Tuberculosis and death;
Diphtheria was there, and in the air
Was fevers' fatal breath.
Filth and mire and fumes most dire,
Microbes that victims sought;
And fevered breath of grim, gaunt death,
Was what the plumber caught.

And now he sings his tuneful lay,
As he twists with many a bang and rap
That pipe of lead which forms to-day
The foe of disease, the plumber's trap.

EVAPORATION OF WATER IN TRAPS.

(The facts in reply to Mr. J. Pickering Putnam, submitted by Andrew Young.)

Thn following experiments made by Glenn Brown, of Washington, D. C., will serve as a reply to Mr. J. Pickering Putnam's "The Trap Vent Law" in last week's issue of The Sanitary News:

Although syphonage and back pressure are the principal causes of failure in the ordinary plumbers' trap, nevertheless water in them will evaporate, and thus break their seal.

It is important to know how long they will withstand the effects of evaporation. The opponents of trap ventilation claim that the evaporation produced by the circulation of air through the soil and vents pipes is sufficient to destroy the seal of traps in ordinary use. If this is a fact it is a serious blow to the usefulness of trap ventilation. Mr. J. P. Putnam, some years ago, made experiments on trap evaporation, the results of which have been extensively published. Unfortunately, he made his experiments on the same stack of pipes, and conducted them at the same time with his experiments on trap syphonage. Anyone can see how great the opportunity was for errors, and further, how impossible it would be for anyone to judge how much of the water was taken out by syphonage, and how much by evaporation.

When the traps were tightly plugged on the house side, the partial vacuum of water caused by the discharge of water from the fixtures above would make the air between the plug and the water expand and force out a small amount of water from the trap. Who can tell how much?

Who could measure the amount of air that might pass through the openings left by an imperfect plug? For these reasons I consider the experiments of Mr. Putnam entirely unreliable.

Some time ago I made a limited number of experiments on the subject at the Museum of Hygiene, United States Navy Department. They were made some time after, and entirely separate from, the experiments which I made at the same place on trap syphonage. Of course, the amount of water evaporated would be in proportion to the surface exposed and the rapidity with which the air coming in contact with this surface was changed. The most effective trap would be the one with the smallest surface and the greatest depth of seal.

I experimented with five traps—Barrett's, Cudell's, Adee's, a 3-inch, and a 1½-inch S trap. All were vented. It was assumed as a fact that the vented traps would be more affected by evaporation than the unvented ones. The traps used represent different areas in proportion to their depth.

The small S trap had the smallest exposed surface and the greatest depth. To give them the severest test for evaporation, they were so placed that a strong current of heated air passed through the sewer branch of the trap and out through the vent pipe, a stronger and more continuous current than they would be subjected to in ordinary use. The broad surface traps lost their seal, as was expected, more rapidly than the ones with a small surface.

The height of the water was measured at different periods, and a steady decrease was shown, being a little greater the last six days than in the four preceding days. This was probably owing to the increased heat of the current of air due to a cold spell. The traps had lost the following amount of water after twelve days: Barrett's, ⅜ inch; Cudell's, ⅝ inch; Adee's, ¾ inch; 3-inch S, ⅛ inch; 1½ inch S, ¼ inch. You see that a small S trap had lost only ½ inch of its seal in twelve days. The seal was an inch and a quarter deep. At the same rate it would have taken sixty days to have broken the seal with the help of a continuous current of heated air passing through the vent pipe to change the particles of air which come in contact with it. I had expected, under the circumstances, to find the seal of the traps broken in a few days. Is it not possible that there is a small column of air comparatively quiescent between the water in the trap and the current passing through the vent, as shown in the sketch?

Although the examinations made of the height of water in the trap were limited, I think the results are ample to establish the fact that the ordinary S trap vented will not lose its seal by evaporation for long periods, and if the traps are filled even once in two months, it will be all that is necessary to keep their seal intact.

The experiments in trap syphonage (read before the American Institute of Architects' Convention held in New York) proved that a simple S trap, properly vented, was safe from failure by trap syphonage and back pressure, while all traps unvented were liable to fall from either back pressure or syphonage. These later experiments prove that the S trap vent is safe from evaporation during long periods.

I would deduct from the two sets of experiments: first, the S trap, properly vented, is the best form to use; second, no trap should be used without ventilation.

"THEORY AND PRACTICE" AND MR. KELLY.

Newport, R. I., March 30, 1891.—Editor The Sanitary News: Your readers have probably not been very deeply impressed by Mr. W. A. Kelly's harping on his "practical" quality. In his communication (issue of January 24), he suggests a distinction between theory and practice which does not exist. No theory stands which practice does not sustain; no practice is good which is not founded on right theory. A so-called "practical" man, if not clear as to the theory of his work, is neither a safe guide nor a good workman, save for the mere manual operations of his trade. His opinion is without value.

As Mr. Kelly seems to draw a comparison between himself and me, and as he may not attach their precise meaning to his words, I will venture to say that my early education comprised a rather thorough manual training, that I was a very fair tin-smith in 1847, that I have been handy with tools all my life, and that if Mr. Kelly is a good plumber it is likely that a good proportion of what he practices in improved house-drainage has been derived from my teachings, which have been rather widely disseminated and accepted by the trade during the past twenty years. I think I am fully warranted in considering my theory quite as reliable as his practice. In your issue of March 14, he asks me two questions which I answer thus:

1. A trap on the highest fixture that enters a soil pipe which is wide open at the top will not be subject to syphonage if the waste pipe is large enough—as it usually is—not to run full bore. I will add that wherever a trap is subject to syphonage, the Sanitas and Puro traps will withstand the syphonage without venting, and any good S or P trap will withstand it with the aid of the McClellan vent.

2. The gases spoken of, when forced by pressure from the sewer go out at the open mouth of the soil pipe above the roof. There is room enough in a 4-inch soil pipe for any discharge occurring in practice to flow down the pipe without preventing back-pressure air from passing up.

If the soil pipe is vertical, the flow will be a spiral swirl around its walls. If it is inclined, the flow will occupy a very small portion of its area on the lower side.

Geo. E. Waring, Jr.

PLUMBING IN DETROIT.

In response to a call a large number of master plumbers assembled at the office of the Water Board last Saturday afternoon. The meeting was held to appoint three members of the examining board, and Secretary Case called it to order. John Cameron was chosen chairman and D. T. Rodger secretary.

Mr. Case read an excellent address on the work of the board last year when the initial step was taken towards the improvement of plumbing by appointing a board which examined all applicants before issuing them licenses to work. While but little was done, the attention of plumbers was called to the fact that the days of snide plumbing in Detroit were over. The benefits of the innovation became plainer as the days rolled by. There are two classes of licenses, and a first-class plumber is examined on all points bearing on any kind of work. Those who apply for second-class licenses are only examined in regard to water and hydrant connections and are not allowed to do general work. Mr. Case read an article from a sanitary paper in which the writer took everybody to task for various things, alleged that the plumbing in Detroit was as poor as could be, no respect was paid to health, etc. Mr. Case told the other side of the story, how he had examined buildings charged to be in very bad condition and found them all right. In conclusion Mr. Case said he hoped the temporary organization of the plumbers be made permanent, and that they hold frequent meetings to discuss papers and matters of interest to them. He extended them the use of the water board office any time they cared to meet.

The meeting thanked Mr Case and adopted his recommendations.

The examiners who served last year were tendered a vote of thanks and re-elected. They are James Lane, James Meath, and Samuel Dxion. Col. Goebel represents the water board on the committee.

Several communications were read and the meeting adjourned

PLUMBING IN CLEVELAND.

Cleveland, O., April 1, 1891.—Editor The Sanitary News: As there has been but little news from this city I herewith give you a few items which are of local interest.

Messrs. Deuston & Schneider have secured the plumbing contract for the Cleveland Gas Co., for a large building to be erected for their use.

Mr. L. Poplousky has nearly completed a large contract on Euclid avenue, and is spending a few days in hunting.

After four years of determined effort on the part of W. A. Kelly with the view of having practical plumbers appointed for inspectors, he has finally succeeded in having a petition signed by all the master plumbers and many of the journeymen, and en-

dorsed by the two candidates for mayor, pledging themselves to see that none but practical plumbers are appointed to that position. Mr. Kelly is one of the best plumbers in the city, taking an active part in all movements toward better plumbing, and deserves a great deal of credit for the good he has accomplished. He has worked at plumbing in all its branches as a helper, journeyman, and for two years was inspector of plumbing, but is now engaged in business for himself. He is a good mechanic and knows the necessity of having plumbing work inspected, and, under our new city government, which the State Legislature has given us, we will have none but practical men for inspectors. Now, if the plumbers will unite in this effort and see that only first class men are appointed for these positions, the public will soon see good results therefrom. F.

PLUMBING NOTES.

The journeymen plumbers of Indianapolis, Ind., were locked out last Friday by their employers, the Master Plumbers' Association, to which seventeen of the leading firms of the city belong, having taken that decisive stand the evening before. P. J. Gall, secretary of the association, speaking to a city reporter in reference to the matter, said: "The important difficulty that must be settled before anything else is considered," he said, "is the question whether work will be done where non-union men are employed. This matter has gone so far that it is now just about impossible to do any work, and I think the union has lost the sympathy of the public. We will send a man out, say to repair a gas-leak, and he will come back in an hour or so and report that he has done no work because he saw some non-union paperhanger or non-union man of some other trade in the house, and he would let the people suffocate before he would do anything. Houses have been measured and pipe has been delivered, and then work has been suddenly dropped for some such reason as this. We can't stand it any longer, and this lock-out will continue until the plumbers withdraw from the federation of trades in this city. There is no question over the eight-hour day. That is the law. The question of wages is subordinate to this other one. This must be settled. There is no objection to the men having a union. I think it's an excellent thing, both for the men and for the employers, but we must have some assurance that our work will be done."

An agreement has been prepared by the association for signature by the workingmen, stating that the latter's pay shall be as per agreement in each individual case, and that they will work on any job, regardless of trades unions. The union of plumbers and gas-fitters has asked as wages for first-class plumbers $3.75 for an eight-hour day, and for second-class men $3; for gas-fitters $3.25 and $2.75 and for steam fitters $3.

J. W. Nier, consulting engineer, has opened a new place of business in room 11, Equitable Building, corner of Sixth and Locust streets, St. Louis, Mo., and has closed his office at Kansas City.

The columns of The Sanitary News are always open to the discussions of all subjects touching plumbing interests, or any subject relating to sanitary science.

The builder or contractor who erects a building and puts in it the cheapest kind of poor plumbing, should be made to live in the death trap he has constructed.

A correspondent has asked in The Sanitary News for some means to prevent the use of inferior plumbing material. Cannot some one give his views regarding the matter? Suggestions from practical plumbers on this subject would be of value.

Look out for next week's issue of The Sanitary News. In it will be commenced a series of articles giving the history of every Master Plumbers' Association in the United States with all matters of interest thereto attached. Every plumber will want to read these articles and file them away for reference. They commence next week and will appear from time to time until all are published.

Officers Connell and Fallon, of Chief Inspector Young's force intercepted a lead thief cutting out lead pipe from a new building on Centre avenue near Van Buren street. Plumbing was being done by Joseph Breen. The thief was immediately placed under arrest, and twelve feet of ⅝ lead pipe were found which he had concealed under his coat. He resisted the officers but was safely landed in the Maxwell street station. The lead found upon his person was produced in evidence, and Justice Doyle sent him to the Bridewell on a $50 fine. The lead thief gave his name as Elmo Grant.

Messrs. Frank G. and George L. Scott of Newport, R. I., have invented a patent pipe hanger which is said to be well thought of by the plumbers of that city. The new device, which is in the shape of a crescent of malleable iron, in various sizes, attached by means of a rod to a socket, can be applied by the plumbers to afford support in the many varying positions in which such pipes have to be placed, without the necessary delay of visiting a blacksmith, and in a manner to give as good if not better support than under the old system. It can also be used for extending pipe out into the sea. The device will not be more expensive than the present hangers, and will cause the saving of considerable time and trouble. The device was the result of the large amount of special hanger work done by the Scott brothers, who felt that work so frequently occurring should have some better means of being met.

President Griffith returned recently from a visit to Milwaukee, St. Paul and Minneapolis. A strike was in progress at St. Paul and the result of the President's visit was an amicable settlement. There was also a threatened strike on for Milwaukee, but all differences were peacefully settled and business pursues the even tenor of its way.

T. P. Culloton has been in the clutches of la Grippe for about two weeks and has not yet recovered his wonted vigor.

Alderman Sanders was taken down with the grip last week and was not able to put in an appearance at the last plumbers' meeting. Wm. Bowden is also wrestling with an attack of the grip.

W. M. Webster, of Rundle, Spence & Co., will soon be viewing the places of historic interest in England, and advancing the interest of his firm abroad.

WHERE PLUMBING WORK IS BEING DONE—MONTH OF MARCH.

Humboldt and Sheriden, Garner & Bros.; Halsted, 434, J. Wilk; Huron near Robey, D. J. Tierney; Honore and 66th Court, Dewar & Co.; Humboldt, 223, Peter Gow; Halsted near 57th, Sherman & Co.; Halsted, 1708, Minshemer; Halsted between 56th and 57th, Doyle; Hubbard near 47th, T. Law; Hastings, 324, Hais; Huron between 47th and 48th, T. Law; Hamburg, 35, C. C. Breyer; Honore and 66th Court, Freb & Co.; Honore and 66th Court, D. Dewar; Homan av. south of Carroll, Geo. Miller; Huron, 4870, Nelson & Co.; Halsted, 5139, M. Stack; Humboldt south of Armitage, Hogan; Irving n. Irving Park, H. Breyer; Irving av. between Willis and Centre, S. Deitcher; Indiana, 757, D. T. Jack; Jackson west of Oakley, D. T. Jack; Langley av., 4400; Langley av., 65, Gleason; Lull Place, 74, C. C. Breyer; Langley av. and 65th, D. Watson; Francisco, 227, G. Miller; Fifth av., 3108 Rentneck; Fillmore, 1579, S. Smith; Fullerton av., 631, J. Schner; 47th, 518, C. J. Boyd; 47th, 655, C. J. Boyd; 59th, 741-43, J. H. Kileen; Fisk, 104, Krestan & Kruz; West 14th, C. Walters; 47th, 111-113, R. P. Probasco; 59th near Winter, Windt & Co.; Fairfield, 943-5-7, Harvey & Mose; Flournoy west of Francisco, Fosket & Bro.; 51st and Loomis, J. J. Quinn; Frankfort, 155, H. Brufe; 47th, 518, C. J. Boyd; Franklin and Tell Court, E. Burkhardt; 49th near Winter, W. Morrow; Fourth av., 110, Geo. Groll; 51st Court and Green, C. J. Boyd; 45th east of Wallace, M. Stack; Flournoy, 165, Hamlin & Co.; Hoyne School, Mallory; Hoyne street, 480, C. C. Breyer; Hinman, 995, Stevans & Mack; Hoyne, 700, C. C. Breyer; Dudley, 509, C. C. Breyer; Davis, 653, P. Goro; Dobson av. near 75th, Sheville; Emery and Leavitt; Emerald av., 5206, Hanslon & Co.; Evans av., 6512, J. B. Sheville; Elk Grove, 964, H. Breyer; Ewing between Halsted and Blue Island, Nast & Hana; Escanaba and 88th, Brunt Bro.; Edgewater Depot, Boroden & Co.; Erie near 91st, Ranike; 11th, 101, C. Kostlevy; Emerald av., 5705, Plumsted; Erie, 964, H. Breyer; Elk Grove, 964, H. Breyer; Evans and 74th, D. Walsh; 14th, 731, Kane; Franklin, 532, Baha & Bech; Fullerton, 447-49, G. Hanslin; Fullerton, 672, Demister; 45th and Sidney, Keeley; Fullerton, 419, Garner & Bro.; Fullerton corner Burchill, Garner & Bro.; 15th, 677, Dornbrs &

Bro.; Fremont, 164, Bayha & Bro.; 52d near Ontario, F. Law; Cook av. and 60th, J. J. Doyle; Congress near 42d, S. Law; Carpenter north of 69th, Geo. Mertz; Commercial corner Selzer, G. Groll; Carpenter, 6502, Laffr & Murphy; Crystal, 171, C. Breyer; Cleaver, 147, C. Breyer; Calumet av., 2217, Brenning & Co.; Congress, 836-8, D. Jack; Dudley Court, 509, C. Breyer; Dudley Court, 840, Harvey & Mose; Drexel boul., 4319, Baggott; Dearborn, 4903 and 5326, Bowden; Dudley, 1017, H. Breyer; De Kalb, 36, J. Walkie; Dickey near 72d, Lyon & Lee; Dearborn, 3501, J. Maskey; Dickey, 5904, Lyon & Lee; Dearborn, 5654-8, M. Paget; Dudley, 1003, Geiss; Dearborn, 4602, Schmidt; Dearborn, 5312, Wixters; Dudley, 840, Harvey & Mose; Division, 707, Harvey & Mose; Dashiel, 3146, J. J. Quinlen; Drexel boul. and 71st, D. Walsh; Auburn, 3206, Coller & Sons; Armitage between Mozook and Cal., Hogan; Bauwans, 58, Breyer; Baset av., 865, Harvey & Mose; Baset av., 7, R. C. Miller; Byrons, 1514, H. Harker; Bingham, 3, H. Breyer; Bingham, 99, H. Breyer; Barcley, 180, P. Gore; Beldon Place, German Training School, F. Newstalt; Baxter, 78, W. Bletch; Berkley, 4314, D. F. Denan; Calumet north of 43d, W. C. Brown; Classel Court, 1416, J. Watson; Cornelia near Mill, Harvey & Mose; Carlin north of 83d, D. J. Hardin; Carpenter, 6219, A. Miller; Carroll near Garfield Park, Macley; Clark, 1275, Maypole; Centre south of 50th, P. Schirat; Centre av., 273, Molter & Co.; Carpenter, 5722, Conraths; Carpenter between 61st and 62d, Conraths; Cleveland, 387, J. Wrenn; Chicago av. between 67th and 68th, Kindrikoy; Centre av. and 55th, E. Connor; Addison and Woodside, J. Shuer; Addison and Herndon, J. P. Dunn; Astor, 144, Brooks; Addison and Herndon, J. P. Dunn; Ayers Court, 42, W. J. Muller; Addison and Woodside, J. Shuer; Atlantic 3950, J. Sheville; Ashland and Graceland, Hanslin; Avenue A between 70th and 71st, Allen; Aberdeen, 6404, A. Miller; Atlantic, 4943, A. Miller; Ashland, 855, C. Aher; Aberdeen, 5720, J. Conraths; Adams, 989, Maclay; Ashland between 38th and 39th, E. Connor; Ashland and 11th, Oliphant & Liddell; Atlantic, 4205, A. Miller; Archer and 38th, E. Sheehan & Co.; Ashland and 21st, W. Daniel & Co.; Armitage, 330, Breyer; Armour & Erie, Nelson & Ceethope; Archer, 2292, Geo. Mertz; Aberdeen near 60th, J. H. Killeen; Ashland, 3145, Wm. Blitch; Auburn, D. J. Denan; Ashland and Huron, F. Falk.

FOR THE DIGESTION.

A French scientist has discovered that the color of water is blue. We never knew before why a town couldn't be painted red with it.

The female bartender is a success. Gentlemen, go several blocks out of the way to look upon the sparkle in her rye.

Physicians have announced that yellow fever can be carried by a mosquito's bill. The disease has not yet been named that is carried by a doctor's bill, but it is something like paralysis.

"My unlucky star reigns," said the theatre manager, as the sheriff seized the evening's receipts.

"Faith, hope, and charity, but the greatest of these is charity," because so many people put both their faith and hope in it.

Job was called the patient man probably because he took such great pains in every thing he did.

Undertaker.—It is made my solemn duty, dear madam, to inquire what disposition you wish made with your dear husband's remains.

Bereft wife.—Well, it seems soon to talk about it, but I was thinking that as I have no heirs it will all fall to me, won't it?

It is said that the street lamps in certain portions of Chicago are so poor that many prominent club men, belated home, have no visible means of support.

An English scientist has just announced that sitting is an acquired habit with man. It may be sitting, but the generally accepted belief is that it is lying.

Despairing daughter.—Well, mamma, the season is over and Freddie has not proposed.

Hopeful mother.—I know dear, but he is much near it than last season.

Despairing daughter.—Why, mamma, how do you judge him?

Hopeful mother.—He asked me very interestedly if you had any brothers or sisters, and inquired very earnestly regarding your father's finances and——health.

One trade holds a monopoly on its representatives in the presidential chair. All of our presidents have been cabinet-makers.

We cannot believe that the nude in art is at all popular judging from the manner in which people avoid the naked truth.

"Have you any upholstered-sold slippers?" said the lad of nine to the shopkeeper. "No, my son; why?" "Oh! I just wanted to get my ma a pair for christmas. That's all."

When you see a man attempt to blow the foam off of a glass of lemonade you may know he is thinking whether to subscribe $50 to the church or make it an even $100.

"You cut that last pair of trousers for me too long." "Yes, I think so. About four months now, isn't it?"

"I cure fits," was the suggestive sign some very wicked boys placed over the door of a second-class tailor.

"I want a pair of shoes made to measure," said a surveyor stepping into a shoe store.

"I buy jokes" advertised the publisher, and the funny men all tried to get a sell off on him.

When two sluggers come together
For a bloody bout,
We forgive the brute somewhat
That knocks the other out.

Father.—I have but one objection, George, to your marriage with my daughter. I cannot bear the idea of having her live so far away from me—so far, out of the country, away over in Canada where ——

George.—But we are not going to live in Canada. What gave you that idea?

Father.—Ain't you cashier of the First National?

George.—I can assure you, sir, that my conduct will be such that I will always live here.

Father.—Then I must decline your offer, for my daughter must marry a man with brilliant financial prospects.

The minister pronounces them one, but the husband discovers there are two, all the same.

The shoemaker sits and pegs away,
And peg he ever so fast,
He must fit his first customer out
While he pegs away on his last.

"I do love to order a rare steak" said the editor. "It is so refreshing and such a relief from the dun."

"Why, you are without your cravat and your collar and even your vest," said the junior to the senior partner as he came down to the store. "Yes I'm in neglige; my wife and I had a little outing this morning."

"I've dropped my locket!" the ballet girl said,
"I vow I must more safely pin it.
And if that got lost I'd better be dead,
For all of my wardrobe is in it."

"Der ish pig monies in der launtry bizness, mine frient, pig monies. My son Isaacs makes as mooch as a kavarter some days washing second-hand postage stamps."

It takes fourteen years to tan some hides in making the finer qualities of leather, but the small boy is generally through with most of the process in ten or eleven.

Discerning daughter.—Mamma, why does that musician stand before everybody every time they play for the dancers?

Mother.—Because, dear, he is a bass viol man.

Blow your horn like a little man,
For no one will help you a drop;
Then blow your own horn as brave as you can—
When you find too much foam on the top.

CONVENIENT TO HAVE ABOUT.

Buttermilk will take out mildew stains.

Clean zinc with soap suds, and polish with kerosene.

After peeling onions, rub celery on your hands and the odor will be removed.

A teaspoonful of pulverized alum added to stove polish will give the stove a fine lustre.

Add a little kerosene to the water, in which varnished wood

work or polished floors are washed, it will greatly improve their looks.

To make flannels keep their color and not shrink, put them in a pail and pour cold suds with a little borax or ammonia in it and let stand for ten or twelve hours, then wash with same suds and rinse in cold water.

Ink stains may be removed from linen by dipping the spot into hot melted tallow, that of mould candles is the best, made of ordinary tallow (composite candles will not do), then wash the linen and the spot will disappear.

The best preparation for cleaning picture frames and restoring furniture, especially that somewhat marred and scratched, is a mixture of three parts linseed oil and one part spirits of turpentine. It not only covers the marred surface, but restores wood to its natural color and leaves a lustre upon its surface. Apply with woolen cloth and rub dry.

A steam pipe cement can be made with linseed oil varnish, ground with equal weights of white lead, oxide of manganese and pipe clay.

For mending cracks in water-backs, stoves, etc., mix mineral asbestos in powder or finely reduced form with sufficient good white lead to make a stiff putty. It shouid be applied while the metal to be repaired is hot, and should be pressed into the aperture while setting.

A cement which is said to withstand frost consists of (a) 1 litre of Portland cement, 3 litres of river sand, and (b) 1 litre of lime cement and 3 litres of river sand, mixed with a solution of 1 kilogram of crystalized soda in two litres of water—a mixture whose ingredients when exposed to a temperature of 12.5 degrees are not in the least altered in their adhesive properties.

PRECAUTIONARY MEASURES REGARDING LA GRIPPE.

Dr. Liston H. Montgomery of the Health Department in an interview a day or two ago stated that the following precautionary measures should be observed:

While the present unfavorable and almost unprecedented prolonged period of damp weather prevails, the vitality of the body is lowered apparently, and oftentimes a tonic is needed as much as anything else; other simple precautions would prevent a great deal of the sickness that is present, and at the same time would diminish the prevalence of the "grip." In the street cars a slight draught through the sides of the windows often enough blows down the necks of the passengers (particularly where the cars are not upholstered or heated) and strikes between the shoulder-blades which is one of the most susceptible portions of the body. The cold penetrates the lungs at this point. People also should keep their mouths closed as much as possible, and breathe through their noses while in the streets; this renders them less liable to "take" cold. The feet should be kept dry; avoid, also, as much as possible, standing on the corner of streets talking to friends, particularly if a damp, cold, raw wind prevails, especially if you have just emerged from a warm room or office, however slightly moistened the surface is by perspiration.

SEWAGE FARMING.

At the third annual dinner of the Association of Public Sanitary Inspectors, held at Liverpool, the President, Dr. Alfred Carpenter, delivered the following address:

I wish to draw your attention to a very important sanitary ordinance found in Holy Writ, viz., the ultimate disposal of human excreta. The earliest lessons in hygiene are found in the laws instituted by Moses, the Hebrew law-giver. He laid it down as a Divine ordinance that all human excreta was to be conveyed to the earth and buried without the camp, or, as it came to pass, when the people had entered in the Promised Land, without the city. This meant its utilization for agricultural purposes. We are also told that all persons and things polluted with unclean substances of every kind were to be washed with water. It is clear that under this law abundance of water was to be provided, and means whereby it should be conveyed away must also have been forthcoming. It always was so in the cities of Israel until they disobeyed the ordinances of Moses, and gave themselves up to indolence and debauchery. When those days came they had among them wise men who put them in mind of the Divine ordinances, and drew their attention to the denunciations which Moses himself uttered against those who in after times should forget or disobey the laws he gave them. It is clearly stated that those who disobeyed those laws should be overthrown by the "armies of the Living God." Those threats are frequently repeated by the Prophets. We are clearly told that those armies would not be regiments of human beings, but the palmer-worn, the canker-worm, the blight, and the mildew. These words, understood as they should be by the light of ancient history, refer evidently to diseases affecting both kingdoms of nature, and it is in the microscopic class of creation that we find the disease germ to which we owe the incidence of cholera, typhus, scarlatina, erysipelas, diphtheria, and all other infectious and epidemic disorders, and even that tuberculosis, concerning which so much mistaken inquiry has lately been going on in the newspaper world. I make bold to state that the mischiefs produced by some of these diseases are the consequences of national neglect of the law that human excreta shall be conveyed to the earth for utilization there. It has been ordained that plant life shall be nourished by means of animal exuviæ and animal decay, and that animals shall be nourished by the aid of the vegetable world. We cannot ignore these facts, and we should try all we can to carry out this law. The threats which are often reiterated in Holy Writ against the class of men who polluted the walls of the cities of Israel by passing water upon them are plain indications of the results which were to follow from this disgusting habit. The habit indicates uncleanliness, drunkenness, and indecency, tending to bring into existence a condition of things in which disease germs can flourish, and the "armies of the Living God" obtain mastery over a careless and disobedient people.

The customs of the Anglo-Saxons on this point are not certainly known to us, but Mr. Seebohn's book upon old English tenures gives us some insight into the plans of our Celtic forefathers, from which it may be gathered that excreta were utilized outside the homestead; but ever since Norman William and his feudal lords erected their castles about the country and placed impediments in the way of exit from them, excreta were left at first in the open fossæ which surrounded the habitation, for removal by other creatures or to be washed away by the rain, and then, as such depots were inconvenient arrangements, holes were dug in the ground in which the products were hidden away under the mistaken expectation that they would be lost to memory as as well as to sight. And so for 800 years the land has been more or less deprived of its principal fertilizing agent. Now just multiply the value of the excreta of a single person as equal to 5s. by the population of the country, and then by 800, which is the very lowest estimate, and you may have some idea of the enormous amount of wealth which has been lost. If I take the average population at 6,000,000, it would have produced simply as a matter of money value sixteen thousand millions of pounds sterling. But there are two other sides of the question besides the mere loss of wealth. The very utilization itself would have necessitated more employment in field labor, and the increased fertility of our land would have kept our agriculturist in the country instead of filling the back streets of our towns with idle hands. Every day's labor would have brought its value to the nation in greater vegetable production, with its sequence of more meat, milk, and vegetables at the command of the multitude. We should then have adopted the right principle of protection instead of the fallacious one of putting import duties upon food stuffs. Had this line been followed instead of disobeying the law, no bread stuff would have been wanted, for the land would have grown all that the population required This is done now in other lands where the average population is much thicker upon the ground than in this country, but who have followed the dictates of nature and necessity.

Let me give you now the results of the practice as it may be carried out in the present day by means of sewage farming. Civilization is such that water carriage must now be used for conveying fœcal and all other pollution matter of animal production from our houses. At present it is but too often sent into the sea or destroyed by chemicals. If, instead of this, it be conveyed to the land, five crops may be secured instead of one; five times the amount of labor would be required, agricultural laborers would be kept at work in the country and at good wages which would give useful profit to those among whom they live, while five times the

amount of meat and milk would be provided for the population which produces the sewage. These are national benefits which can scarcely be over-estimated in these times when the country has to import bread stuffs and immense quantities of beef, mutton, and pork, because enough cannot be raised at home, and we are so far dependent upon the outside world that if we lost the command of the sea we should be at our enemy's mercy.

Economists will say that we do not raise them at home because we can get them cheaper from abroad; then why do we raise any at all? I contend that we only import enough to fill up our own deficiencies, and that not a single head of stock could come into the country it the land—especially if the Irish landlords had done their duty—were cultivated as it ought to be, and our excreta utilized. I hope the day is not far distant when Parliament may decree that sewage shall not be destroyed by chemicals or sent into the sea, that such things shall be antinational offences asmuch as piracy and slavery, and shall be disallowed by common consent.

It has been determined that a local authority which allows its population to be without a pure water supply is failing in its duty, and is liable to be cited before the higher power of the Local Government Board. It is quite as important that our young children should be provided with milk. No more beneficial operation could be performed by any given locality than by so arranging that their sewage shall grow rye-grass, that the rye-grass shall feed milch cows, and that the milk thus produced shall be sent into the city, so that our poorer population may get a pure article at a reasonable price instead of having to do without it altogether, or having a very spare supply. If this source of milk supply were regulated in a proper manner, and each acre of sewaged land made to utilize the sewage of 200 to 300 persons, and produce 42 tons of rye-grass or roots in the course of the year, there would be milk enough for the children of these 250 persons and some to spare for those of larger growth, who might like it as an article of diet, with the certainty that if the authority did its duty no diphtheritic germs could possibly find their way into the milk cans when properly supervised. I commend this view to your special attention—more milk for our children, more work for our agricultural population, higher wages for those employed, fewer unemployed in the streets of our great towns, more meat raised in our own neighborhood instead of our having to seek it from distant lands. This meat is not loaded with unhealthy fat, but is substantial in character, and not liable to go into the dripping-pot of the cook; it wastes less and contains more force producing material than that which is the result of feeding on oil cake, or by other artificial means. I have tested this over and over again, and I am satisfied that the majority of people will prefer cow-beef from a well managed sewage farm to bullock-beef which has been fed on artificial food.

But there are other benefits which result from the utilization of sewage upon the land. If it be carried out on those principles which can alone secure its satisfactory application, there will be a complete destruction of all disease germs. Let me state the fundimental principles. Take an ordinary water-closet town; there should be 35 acres of land provided for every 10,000 of the population. There will be an average 5,000 to 6,000 tons of sewage annually for each acre of land, to some extent regulated by the water-supply and the exclusion of rainfall from the sewers; each acre must grow from 40 to 45 tons of produce. This amount must be taken off the land year by year, sometimes more, sometimes less, according to the average warmth of season. There will then be a complete purification of the water, the land will be free from excess of nitrogenous matter in its surface earth, for it will not find its way into the deep subsoil if properly laid out, and cultivated by a proper rotation of rye-grass, three years roots, one years cereals, one year the latter without sewage, there will be complete health to those who live on the farm and in the neighborhood, and benefits will be forthcoming for all concerned.

I have said that disease germs will be annihilated. They can no more increase and multiply on a properly managed sewage farm than gunpowder can explode if it be kept wetted with water or mixed with moist sand. The presence of organic life in the humus on the soil, and the embrace of the minute radicles of a growing crop set up a series of changes which are absolutely fatal to disease germs. I am able to corroborate this statement by a continued observation of one of the largest sewage farms in the kingdom, upon which the excreta of thousands of cases of infectious disease have been spread during the past thirty years (including that of pleuro-pneumonia among cattle), yet not a single series of cases has arisen in the locality. I had almost said not a single case of enthetic disease which by any force of reasoning could be attributed to the operations on the farm. The experience which was gathered by the Local Government Board a few years ago also proved the truth of this proposition, as does that which is yearly reported from most of the large lunatic asylums in the kingdom. These asylums not only utilize their sewage in this way, but also consume the produce within their own precincts, proving conclusively both the safety of sewage farming and the satisfactory nature of the produce grown on the farm. This fact is well known to the managing committees of these establishments, and their opinions are to be found in the reports of managing committees of county asylums to county councils, or as they used to be to the Quarter Sessions of the county.

There is another item which is just now of serious import—it is the steady annual increase in the number of deaths from diphtheria. Fifty years ago, when it was unknown under this appellation, I witnessed a limited outbreak of the disease, under the name of putrid sore throat, in a small town in a midland district. Nine children died out of seventeen attacked, within a single month; but, so far as I know, it extended no farther. I know nothing of the cause of this outbreak. If to-day we take up the annual reports of our county authorities, we find scarcely a district in the kingdom, especially those purely agricultural, in which a few cases have not occurred.

I have been studying the report of one of the able men recently inducted into office by a neighboring county council. It is curious to note the isolated deaths in more than twenty villages in the county, while in the towns they were also reckoned in larger numbers; and in eight places, like London and other large towns, in which the disease was formerly unknown, except by occasional isolated cases, the deaths are now reckoned by hundreds.

Why is this? It arises from our mistake in having preserved our disease germs in cess-pools and other midden storages, instead of having them destroyed by Nature's scavengers, the vegetable world. The foci are gradually increasing in numbers; our sewers are becoming seriously infected, so that it only needs a summer, following upon the next severe winter, which is our due, to bring out this factor in mortality to an extent never before experienced and in ways likely to produce, as usual, panic and its consequent mistaken action on the part of the local authorities. It is for you to diminish the incidence of this epidemic by urging your local authorities to hurry away all excreta to its proper place, and to carry out the ordinance of "Wash and be clean." Sewers which are sewers of deposit must be relaid on safe principles; house drains similarly treated, they must be flushed and ventilated in a thoroughly simple and yet scientific manner. You must be especially energetic in hot dry season, and in this way you may prove yourselves to be guardian angels against the sword which is about to descend upon a neglectful people, and thus prove the Divine origin of your office.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: H. Soderberg will build, on Lincoln street, a three-story basement and attic flat building, of pressed brick and stone front, to cost $15,000. H. S. Jaffray and E. J. Ohrenstein have made plans for a three-story and basement apartment building, at Evans avenue, near Forty-third street. D. H. Burnham is getting out drawings for the sixteen-story office building, at No. 120 Dearborn street, for the Columbian Vault Co. It will be of brown pressed brick and brown terra cotta, and cost $350,000. J. F. and J. P. Doerr have made plans for a six-story and basement hotel. It will have a buff Bedford stone front, slate mansard, hardwood interior finish, and all the modern and sanitary improvements, to cost $50,000. F. P. Elliott will build a two-story basement and attic residence, at Oak Park, after plans by Wesley A. Arnold; cost about $15,000. H. B. Wheelock is planning a six-story apartment house, to be built at the southwest corner of Indiana avenue and Twenty-fourth street by the

Ricardi Apartment House Co., of which James M. Stebbins and James G. Cozzens are the principal promoters; cost, $300,000. Edbrooke & Burnham have planned a two-story residence for W. B. White, to be built on Grand boulevard and Forty-sixth street; hot water and heating apparatus; cost, $50,000. Burling & Whitehouse are planning a three-story residence for J. T. Bowen, to be built on Astor street, near the Lake Shore drive; it will be constructed of pressed brick, stone and terra cotta, with elaborate interior finish; cost, $40,000. The same architects have planned the superstructure for St. Pius Catholic Church on Ashland boulevard, near Twentieth-street; cost, $30,000. Edmund R. Krause has planned a three-story and basement store and flat building for F. Grossman, to be built at the corner of State and Fifty-sixth streets; it will be constructed of stone and brick; cost, $15,000. I. C. Zarbell has planned a seven-story and basement warehouse, to be erected on West Randolph street, near Union, by Arnold Bros.; it will be constructed of pressed brick and stone; cost, $50,000. He has also planned a four-story and basement apartment house, for Frank H. Follansee, to be erected on Wabash avenue, near Thirty-third street, and to be constructed of rough stone and pressed brick; cost, $30,000. Also a store and flat building, for Carl Curtis, to be erected on North Clark street, near Lincoln park; it will be constructed of pressed brick and stone; cost, $20,000. Henry Sierks has planned a four-story and basement warehouse, for Freese Bros., to be built at the corner of Chicago avenue and Carpenter street; brick and stone construction; cost, $20,000. He has also planned two additional stories to be put on Ortmayer & Son's five-story warehouse at 116 and 118 Illinois street, at a cost of $10,000. Also a two-story factory for Kurtz Bros. & Buhrer, to be built at Diller street and Austin avenue, brick and stone construction; cost, $6,000. Julius Huber is planning a two-story factory for Zero Marx, to be built at 160 and 162 East Superior street; stone and brick construction; cost, $18,000. Robert Rae has planned three three-story and basement dwellings, to be built at 4413 and 4417 Ellis avenue by T. E. Follansbee; they will be constructed of stone and brick; cost, $30,000. C. M. Palmer has planned a three-story flat building, to be built on Lill avenue, near Lincoln, by Butts & Co., to be of stone and brick construction; cost, $6,000. W. A. Arnold has planned a two-story residence for Mrs. F. T. Elliott, to be built at Oak Park, to have a stone foundation and wood superstructure; cost, $9,000. Faber & Pagels have planned a three-story and basement flat building, for Samuel Snowden, to be built on Morgan street, between Ogden avenue and Indiana street; cost, $10,000. Also a two-story and basement flat building, for Michael Rennehan, to be at 3410 South Halsted street; cost, $8,000. M. H. Church has planned a two-story basement dwelling, for P. J. Cahill, to be built at 980 Warren avenue; it will be of stone construction and cost $6,000. Pond & Pond have planned a two-story and basement residence, for Mrs. Sadler, to be built at 1525 Fulton street; cost, $6,000.——Philadelphia, Pa.: The Philopatrian Literary Institute will build an edifice on Twelfth street south of Locust at a cost of $70,000, from drawings by Architect E. F. Durang. A parsonage will be erected at Park avenue and Berks street by the congregation of Park Avenue Methodist Church. The congregation of Grace Presbyterian Church at Jenkintown, Pa., will erect a new edifice. A four-story residence will be erected at Seventeenth and Latimer streets by H. A. Lewis. A factory will be built at Holmesburg Junction by H. H. Barton for the manufacture of sand-paper. A handsome residence and large stable will be erected near Wilmington, Del., for Mrs. Margaret Du Pont, drawings prepared by Architect Albert W. Dilks, of Philadelphia. Architects John Frazer & Son, have prepared the drawings for a large church to be erected at Wayne, Delaware county. John C. Harris will build a handsome house at Camden, N. J. Ground will be broken for a number of houses at Forty-second and Spring Garden streets by Builder Saunders. The plans for houses were by Architects Hazelhurst & Huckel. E. H. Middleton will erect a large residence at Leiper street and Oxford road. R. C. Ballinger & Co. have the plans for a large hotel to be erected in the south. At Richmond and Wellington streets, the Second and Third Streets Passenger Railroad Company will build a large addition to its stables. Plans have been prepared for a library and lyceum to be built at Boston, and a large hotel to be erected at Bristol, Tenn. Architects, Hazelhurst & Huckel. A six-story hotel will be erected at the northeast corner of Chestnut and Thirteenth streets by William Boothby. Contracts have been let to Charles C. Haines for the building of a six-story structure in the rear of Nos. 1231 and 1233. Architect Addison Hutton has plans for an addition to be built to the Pennsylvania Hospital. Drawings for a new hotel soon to be erected at Mount Holly, N. J., have been prepared by Architect S. D. Button. Architect A. C. Wagner is engaged upon the plans for the brewery to be built at Buffalo, N. Y. Moses & King, architects, have prepared plans for a large bank building to be erected at Wilkesbarre, Pa. Thomas P. Lonsdale has completed the drawings for the edifice to be erected by the congregation of the Western Methodist Episcopal Church.——Pittsburg, Pa.: Architect F. C. Sauer has plans for an annex to St. Joseph's German Catholic Orphan Asylum. The addition will be 70x128, three-stories high, built of brick and stone trimmings throughout. Architect A. E. Linkenheimer, Allegheny, has plans for a large tannery building, to be erected for A. Groetzinger on River avenue, Allegheny. The school authorities of the Fourteenth ward have purchased a tract, 236x175, on Ward street, upon which a new school-house will be erected. No plans have been decided upon as yet. Architect F. C. Sauer has plans for a six-story brick block for W. L. Kann & Co., to be erected on New Grant street.——Washington, D. C.: Chas. W. King will build four residences on Delaware avenue between C and D streets northeast, in square 683. They will be three-stories and basement, with fronts of press brick and Hummelstown brown stone; cost, $24,000. Jonas, Gibbs & Co., have contract to build a three-story and cellar dwelling, for Mrs. E. S. Steele, on T street near Sixteenth. It will have front of press brick and Hummelstown brown stone; cost, $5,000.——Johnstown, Pa.: Arrangements are being made by the school board for the erection of two new school houses, one of twelve the other of eight rooms. Mrs. James Quill will erect a handsome three-story brick building for business purposes on Clinton street. It will be 30x90 feet with front of iron and glass, modern improvements. The plans were drawn by Geo. Krueger.——Lancaster, Pa.: Bids will be received in a short time for the erection of the two school houses.——Parkersburg, W. Va.: J. B. Hastings will erect a nail factory at Salem, Va. It will be 200x80 feet in size, one story high and cost $10,000.——Findlay, O.: W. T. Baker will erect a roller flour mill, to be 80x120 feet, four-stories, built of common brick; cost, $12,000.——Zanesville, O.: Architect H. C. Lindsay has prepared plans for an axle factory for the Zanesville Axle Company, to be 300x300 feet, one story, built of frame; cost, $10,000.——Berwyn, Pa.: The I. O. O. F. will erect a hall at an estimated cost of $12,000.——McKeesport, Pa.: The site for the erection of the new hospital has been selected in East Park. Dr. T. L. White can give particulars.——Norfolk, Va.: Architect G. C. Moser has prepared plans for a new edifice for the African M. E. congregation. To be built of brick, terra cotta, and heated by steam; cost, $12,000. The same architect has prepared plans for a court house to cost $18,000.——Roselle, N. J.: O. S. Teale has completed plans for a frame chapel, to be built for the Congregational Society. The building will be in the Gothic style of architecture; cost, $18,000.——Syracuse, N. Y.: Architect Archimedes Russell has prepared plans for a warehouse for Jacob Marshall & Son; to be four stories, built of common and pressed brick, terra cotta; cost, $20,000.

HEATING AND LIGHTING.

Galveston, Tex.: The capacity of the electric light plant will be increased.——Fulton, N. Y., is to have a new electric light company to be styled the Fulton Electric Light and Power Co. Incorporation papers have been issued, and the company is to have a capital stock of $80,000.——Athol, Mass.: The Athol (Mass.) Gas and Electric Company, capital $25,000, has been organized. G. C. Moses is president.——Seattle, Wash.: The Domestic Heat, Light and Power Company has been incorporated with a capital of $10,000.——Ashland, O.: The Ashland Gas and Electric Light Company has been incorporated with a capital stock of $50,000.——Philadelphia, Pa.: The La Roche Electric Works of Philadelphia has been incorporated with a capital stock of $100,000. Incorporators—Alfred I. Du Pont, of Wilmington, Del.; Frederick A. La Roche, P. Reinbalter, S. E. Trainer, Gottfried Bender, G. Harry Davis and M. L. Fincker, of this city.

——Kensington, Ga.: Prices are wanted on new and second-hand arc lights by G. L. Hogan.——Pulaski, Tenn.: The Legislature will be petitioned to authorize the city to issue bonds for the erection of an electric light plant.——Morristown, Tenn.: The capacity of the electric light plant is to be increased.——Wateree, S. C.: The Wateree Oil Mills desires to put in a 15 to 25-light, electric plant. Address A. G. Clarkson, proprietor.——Austell, Ga.: The city wants bids for the establishment of an electric light plant of 300 lights. Address C. J. Shelverton, Mayor.——Greenwood, Miss.: The Ragsdale Manufacturing Co. expects to put an electric light plant in its foundry and machine shop.

SEWERAGE NOTES.

Salsbury, N. C.: The Legislature has a bill before it authorizing the city to issue bonds for sewerage improvements.——Clarksville, Tenn.: The city will expend $100,000 for completing its sewerage system.——West Point, Mo.: Considerable work on sewers is to be done this summer.——Hartford, Conn.: Some sewerage work will probably be done this season.—— Huntington, W. Va.: The city council has adopted an ordinance authorizing the issueance of $70,000 of bonds of street improvements and $12,000 for sewerage construction; an election will be held to decide as to same. For further information, address the Mayor.——Erie, Pa.: It is expected that an intercepting sewer, to cost between $40,000 and $50,000, will be built this summer. The city council has appropriated $10,000 as the city's proportion of the cost.——Westfield, Mass.: It is proposed to lay about 17,000 feet of sewer pipe this season. Plans for the work are being perfected.——Cleveland, O.: A new sewer is to be constructed on Broadway.——Spokane Falls, Wash.: Plans involving the laying of 6,100 feet of sewer pipe are under consideration by the city council.——Whatcom, Wash.: The city council is discussing the proposition to expend $200,000 on a system of sewerage and extending the city limits.——Atlanta, Ga.: An ordinance providing for about $9,000 worth of sewer work is being considered.——Swampscott, Mass.: The subject of sewerage is being investigated by a committee appointed to act in conjunction with the selectmen.——Troy, N. Y.: The construction of several new sewers has been recommended by the public improvement commission.——Nantucket, Mass.: The sewerage question is being investigated by a special committee.——Marion, O.: Address Charles W. Leffler regarding sewerage.——Danbury, Conn.: For particulars regarding sewerage, address Charles S. Peck.—— West Superior, Wis.: Address Lewis Larson regarding the construction of sewers.

WATER WORKS NOTES.

Woonsocket, R. I.: Authority will be asked to expend $100,000 for water supply.——Toronto, Ont.: The water committee has asked for an appropriation of $120,000 for two new 10,000,000 gallon pumps and a new pumping station.——Portsmouth, N. H.: The water bill has become a law.——Portland, Ind.: Water works will be constructed.——Olney, Ill.: Efforts are being made to construct water works at a cost of $15,000.——Dundee, Ill.: The question of constructing water-works is being discussed.—— Lyons, N. Y.: A large number of new taps will be put in as soon as spring opens.——Springfield, O.: The water-works trustees recommend the issuance of $25,000 bonds to extend mains.—— Goffstown, N. H.: A vote will be taken April 7, on the question of water supply.——Methuen, Mass.: The question of better water supply is being agitated.——Crockett, Tex.: The water-works question is still being agitated with some prospects of success.——Danville, Ky.: A proposition has been made by W. H. Whitcome and others to construct water-works and furnish the town with fifty-five hydrants at $60 each yearly.——Newberry, S. C.: A council committee has reported upon the cost of water-works and electric lights. It is estimated that the combined yearly expense would be not less than $5,000. Englewood, N. J.: The Hackensack Water Company is taking steps to extend its system and increase the pressure. It is proposed to build a reservoir or stand-pipe at some suitable spot on the high ground between Englewood and the Palisades.——Brownwood, Tex.: The construction of a reservoir to suppply the city with water is projected; cost about $20,000. Secretary Board of Trade can give information.——Waxahachie, Tex.: T. R. Anderson, W. F. Devin, M. B. Templeton and others have incorporated a water company with a capital stock of $30,000, and has received franchise to build water works.——Fernandina, Fla.: Address C. Williams, superintendent, for information regarding the improvement of water-works.——Hendersonville, N. C.: V. L. Hyman requests full information regarding water filters.——New Berne, N. C.: The contract for the construction of water-works has been awarded to G. E. Ladshaw of Spartanburg.——Midway, Wasatch county, Utah: J. Watkins, Sr., is chairman of committee appointed to investigate the matter of water-works construction.——Madison, Ga.: The city is negotiating for the construction of water-works.——Braintree, Mass.: The city has voted to issue $100,000 in bonds in accordance with the act incorporating the Braintree Water Supply Co. The selectmen and water commissioners were directed to petition the Legislature for leave to issue $50,000 additional bonds for necessary extension of the water-works.——Dayton, Tenn.; The construction of water-works is contemplated.——New London, Wis.: Address Mayor R. S. Johnson A new water-works system.——Middleburg, Vt.: A regular system of water-works will probably be constructed this season.——Sumter, S. C.: Address the Mayor regarding the construction of water-works this summer.——Niles, O.: Authority has been asked of the Legislature to bond the city for $50,000 for water-works.——Ashland, Ky.: J. M. Gardiner, William Poage and P. D. Nicols have incorporated the National Water Supply and Guarantee Co. of Ashland, Ky., to erect electric light plants, construct water-works, sewerage systems etc. The capital stock is $1,000,000.——Rome, N. Y.: W. C, White is chairman of a committee which is revising estimates on cost of about 200 tons of water pipe for the proposed main to the county house.

BIDS AND CONTRACTS.

Marion, O.: Bids for sewer construction are wanted. Address A. H. Kling.——Williamsport, Pa.: Bids are wanted for brick paving. Address City Clerk J. J. Galbraith.——Belem Para, Brazil.: Bids for gas lighting are open until July 19. Address Brazilian Consulate General, 6 Great Winchester St., London, England.——Hindsdale, Ill.: Sealed proposals will be received by the President of the Board of Trustees of the village of Hindsdale, Illinois, until 2 o'clock the 13th day of April, 1891, for the construction of a system of water-works, according to plans and specifications for the same now on file in the office of the Village Clerk.—— Beardstown, Ill.: The city is prepared to receive proposals for the construction of a water-works system. The city has a population of from 6,000 to 7,000. Address H. M. Schmoldt, Mayor.—— Washington, D. C.: Sealed proposals for furnishing and delivering the cut-granite of light-blue grey color and fine grain required for the chimney, two small lodges and curbing of the boiler-room, and for pump-beds and girder templates, for the building for the Library of Congress, in this city, will be received at the office of Building for Library of Congress until 2 o'clock p. m. on Saturday, the 18th day of April, 1891, and opened immediately thereafter in presence of bidders.——West Point, N. Y.: Sealed proposals, in triplicate, will be received at the office of Past Quarter Master until noon, Thursday, April 16th, 1891, for the construction of an Academic Building. Plans can be seen and forms and specifications obtained at this office or at the office of Mr. R. M. Hunt, architect, Tribune building, New York City.——West Point, N. Y.: Sealed proposals, in triplicate, subject to the usual conditions, will be received at the office of Quarter Master, until 12 o'clock, noon, on the 17th day of April, 1891, for the erection of a Brick Cavalery Barracks as per plans and specifications to be seen at this office. ——Newport, Ky.: Sealed proposals, in triplicate, subject to usual conditions, will be received at the office of Constructing Quarter-master until 11 o'clock a. m., April 23d, 1891, and then opened, for construction, at Fort Thomas, Kentucky, of the following described buildings of brick and stone, and for the plumbing and gas piping for same, viz.: Two (2) single sets officers' quarters, two (2) double sets officers' quarters. The bids to be separated, as follows: 1st, Building, complete, except plumbing and gas piping; 2nd, plumbing and gas piping.——Washington, D. C.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 17th day of April, 1891, for all the labor and materials required to complete the basement and area walls, etc., for the U. S. Custom House and Post Office Building at Newark, New Jersey, including excavation, concrete foundations, iron work of basement and first story floor, etc., in accordance with drawings and specifications, copies of which may be had on application at this office or the office of the Superintendent at Newark, N. J.

KOCH'S LYMPH.

Dr. Koch's lymph will doubtless prove a great boon to suffering humanity, but it is yet in the experimental stage. The remedial value of the waters at Hot Springs, Ark., has been demonstrated. This great health and pleasure resort is reached directly via the Wabash road. Compartment sleepers Chicago to St. Louis, where direct connection is made with a double daily line of sleepers for Hot Springs. Berths reserved through.

THE WINTER RESORTS OF FLORIDA AND THE SUNNY SOUTH.

At no time in the history of southern travel have the indications pointed to so brilliant a season at the winter resorts of Florida and the South as is promised for 1890-91. At Jacksonville, St. Augustine, and along the Indian river extensive preparations have been made for the entertainment of northern guests, and all visitors can rest assured of the old-time hospitality for which the southern host is famous. With its customary enterprise, the Big Four Route, "The Great Florida Line," has placed on sale round-trip tickets at greatly reduced rates, and made special preparations to handle the southern tourist business. All persons contemplating a trip to Florida should ask for tickets via that popular line. Solid vestibule trains run daily between Chicago and Cincinnati, equipped with private compartment buffet sleeping cars, reclining chair cars, and elegant parlor cafe dining cars, lighted by gas and heated by steam, making direct connection in Central Union depot, at Cincinnati with through trains for all points in the South. Ask for tickets via the Big Four Route. D. B. MARTIN, General Passenger Agent, Cincinnati, Ohio.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the BIG FOUR ROUTE, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the BIG FOUR ROUTE, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

PLUMBERS' SUPPLIES.

The Whittaker Supply Co., 151 W. Washington street.

SEWER BUILDERS.

Dee, Wm. E., 154 La Salle street.
Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Boyd, T. C., 42 Dearborn street.
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Gay & Culloton, 50 N. Clark street.
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Kelly, Thomas & Bros., 75 Jackson street.
Klein, Stephen, 712 and 714 Milwaukee avenue.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Probasco, R. P., 36 and 38 Dearborn street.
Reilly, Joseph & Bro., 517 W. Madison street.
Roche, J. H., 208 Thirty first street.
Roughan, M. J., 25 Quincy street.
Ruh Valentine, 548 Wells street.
Sanders, P. & Son, 1413 Wabash avenue.
Schmidt, Ira T., 145 Michigan street.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED.—A FIRST-CLASS BOOK-KEEPER to take stock in a thriving plumbing, steam and gas fitting business that will soon be incorporated. Business of fifteen years' standing. Population of city 20,000. Business increased fifty per cent. last year. Party must have a thorough knowledge of the business and bring A1 reference. Address, "D.," care of THE SANITARY NEWS, stating experience and full particulars.

WANTED—AT ONCE—TEN FIRST-CLASS responsible salesmen who thoroughly understand the plumbing, steam-heating, gas-fitting, and machine supply business, to sell to the jobbing and small trade. WESTERN MERCANTILE CO., C. N. HOOPER, Manager, Dubuque, Iowa.

WANTED.—TWO GOOD TRAVELING MEN in our line for the territory tributary to Chicago and the West. State experience, age, and give references. L. WOLF MFG. CO., Chicago.

WANTED.—A MAN ABOUT 30 YEARS OF age who has been accustomed to working specialties with Architects. Address J., care of THE SANITARY NEWS.

WANTED.—A GOOD PLUMBER, GAS AND steam fitter. Married man preferred. Must be sober and reliable. Steady employment. Wages $18.00 per week. Address H. C., care THE SANITARY NEWS.

BUSINESS CHANCES.

FOR SALE.—A PROSPEROUS PLUMBING business, located in one of the best cities of the Ohio valley. Reasons for selling. Full particulars. Address GAS, care THE SANITARY NEWS.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN 25 years of age, eleven years' experience at plumbing and gas-fitting; considered a first-class hand, and a fast workman; have been in business for myself (up to Jan. 1st) nearly 5 years; understand drainage, drawing plans and estimating thoroughly; job in growing town in the South preferred. Must be steady. Address PHILADELPHIA PLUMBER, care THE SANITARY NEWS.

SITUATION WANTED AS TRAVELING SALESman in the line of plumbing or steam goods. Have had several years experience in retail store, can estimate any of this kind of work; strictly temperate. Address, R. B. this office.

SITUATION WANTED.—BY A YOUNG MAN who has had one year's experience with supply house in this city. Some expeaience with stock and is well acquainted with prices. Address R. J., care THE SANITARY NEWS.

SITUATION WANTED.—WANTED A POSItion by a first class gasfitter, married, strictly sober and a hustler. Recommendations can be seen by calling on Andrew Young, Chief Inspector, Board of Health, Chicago. Cost of ticket to come out of wages. Can go at once. Salary wanted $50.00 per month. Steady work wanted quickly. Address, Frank Craycroft, Florence, Ala. "We thoroughly recommend him," North Alabama Steam and Plumbing Co., Florence, Ala.

SITUATION WANTED.—BY A YOUNG MAN as book-keeper in a plumber's office. Have had several years' experience in that line of business. Address, "M. F.," care of THE SANITARY NEWS.

WANTED.—A POSITION AS GENERAL SUPerintendent or foreman in plumbing establishment, by a Philadelphia practical plumber. One who understands the business thoroughly, and also the chandelier business. Has been in business and has been foreman in chandelier factory and has been plumbing inspector in Philadelphia. Can estimate from plans and specifications, and can draw plans. Address, W. 412 Green wich St., Philadelphia, Pa.

SITUATION WANTED—BY A PRACTICAL man as book keeper in plumbing shop. Thoroughly understands the business. Address, F. D. GASSMERE, 3632 Wentworth Av., Chicago, Ill.

SITUATION WANTED—BY A YOUNG MAN to take full charge of a plumbing supply business. Has had ten years' experience and can furnish the best of references, as to character and ability. Address, "W," care THE SANITARY NEWS.

SITUATION WANTED—PRACTICAL BOOKkeeper, age 21, located with a prominent city firm, desires position with a first-class house. Reference, present employer. Address, J. F., care of THE SANITARY NEWS.

SITUATION WANTED—AS RETAIL GAS FIXture salesman, or plumber's book-keeper and collector. Might form a partnership with some practical plumber who is already established. Ten years' experience, abundance of references. Address, K. C., care THE SANITARY NEWS.

SITUATION WANTED.—WITH MANUFACturer or Jobber in the supply business, by an unmarried man of good address. Have had seven years experience with the Plumbing and Steam Heating trade in the East and am rated as a salesman of ability. Can give reference. Address W. M., care of THE SANITARY NEWS.

SITUATION WANTED—BY A PLUMBER, GAS and steam fitter; 22 years old; single; strictly temperate; served four years. Can furnish good references and would like work in or near Chicago. Address, "W. A. F.," care of SANITARY NEWS.

WANTED.—POSITION BY A GRADUATE engineer; three years experience in city work and one year as instrument man on railroad construction, fair draughtsman and letterer. Reference given. Address, Engineer, care THE SANITARY NEWS.

SITUATION WANTED.—A YOUNG MAN OF 19 desires a place to finish up his trade at plumbing and gasfitting; has had one and a half years experience. Address, J. H. S., 1018 Market St., Pottsville, Pa.

PROFESSIONAL.

HENRY ROBERT ALLEN, MEM. SAN. INST. Surveyor, 50 Finsbury Square, and 319 Victoria Park Road, South Hackney, E. London inspects houses and furnishes reports of their sanitary condition. Terms moderate. References. London agent for THE SANITARY NEWS, published at 88 and 90 La Salle street, Chicago, Ill., U. S. A. Money orders and checks should be made payable to THE SANITARY NEWS.

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WM. PAUL GERHARD, CIVIL ENGINEER, author of "House Drainage and Sanitary Plumbing," "Guide to Sanitary House Inspection," etc., offers advice and superintendence in works of sewerage, water supply, ventilation, and sanitation. Sanitary arrangement of Plumbing a Specialty. Work in Chicago and the West particularly desired. Correspondence solicited. 39 Union Square, West, New York City.

JOSEPH B. BURTT, ATTORNEY-AT-LAW, and formerly connected with THE SANITARY NEWS, makes a specialty of plumbers' claims and the mechanics' lien law. La Fayette Building, Suite 42, 68 74 La Salle Street.

PLUMBERS' CARDS.

*DAVID WHITEFORD, PRACTICAL PLUM*ber and Gas-fitter. Sanitary plumbing a specialty. 372 W. Randolph Street, Chicago, Ill.

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ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to The Sanitary News.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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THIS week we publish an interesting article on the Rochester Master Plumbers' Association. In our next issue will appear one as interesting regarding the Philadelphia Association, John E. Eyanson, president. It is unnecessary to speak of the value of these articles to the different master plumbers' associations, to the trade in general, and to the relation of the trade to the public. These articles will be read by a large number of persons who are not members, and by almost all the health officers and city officials in the United States. The articles will impress upon these people the importance of the vast interests of the plumbing fraternity, illustrate its magnitude, and demonstrate its close relation to the highest public welfare. Other similar articles will follow, and we wish to request those who have not yet sent in their articles to make them as full and complete as possible in order that a presentation worthy of the cause may be made.

WE note that an amendment to the factory inspection law, making the act apply to all employers instead of where ten persons and over are employed, is being pushed by united labor throughout the state of Pennsylvania. Under the statute as it now stands one-third of the manufacturing establishments and stores escape the provisions of the law. Even as it is, many parents swear that their offspring are 12 years old when their appearance contradicts the assertion.

The inspector's work among the sweaters on certain streets in Philadelphia has only recently been inaugurated. Here a shameful state of affairs exists, but the amendment to the law is necessary to effect any improvement, for most of the contractors manage to keep their pay-rolls below the number designated in the inspection law. Many of the workers are employed in rooms deficient of light and ventilation; whole families work, eat and sleep in the same room; hours are unlimited, and children who can hardly speak the English language are able to say they are "just past twelve."

The inspector has come across many places where the same toilet-rooms are used by both sexes. Other conditions in manufactories not within the reach of the statute show the pressing necessity for an extension of the jurisdiction of the inspectors. The year's working of the inspection law has, however, done incalculable good in providing fire-escapes, decent sanitary conditions and other needed improvements.

The inspections of Wesley P. Godfrey have comprised over 1000 visits to mills in Philadelphia, Bucks, Montgomery and Delaware counties. The employes numbered 59,344 males, 53,213 females, and 12,709 children under 16 years of age. The dismissals were 18 children under 12 years. Mrs. McEnery, another inspector, labored among the stores about town, where 40,937 female and 39,202 males are employed, with 7,951 under 16 years. She has ordered the discharge of nearly 200 who were under age. This state of affairs exists in many cities, and the enactment of adequate inspection laws, and the appointment of a sufficient number of qualified inspectors cannot be too strongly urged.

THE *Journal of Building*, in stating some sanitary provisions that should be made in building construction, says that a cemented floor under the whole area of a house is a sanitary necessity, because the "air in soils" is more or less impure at best. There is no excuse for building underground apartments in the country. They are never wholesome anywhere, and if families are compelled by stringent reasons to live in the city, where basement dining rooms and underground kitchens are the rule, they should endeavor to have an upper sitting room and live in it as much as possible. The very placing of a house on any ground and living in it under any ordinary circumstances causes suctions into its interior of impure soil air, because the air of the house is warmer than the air beneath it, and this induces a rush of cold air to the warmer house atmosphere. The concreted floor will, in a great measure, do away with this difficulty, but not altogether. Ventilations of cellars must, therefore, be attended to, no matter how clean and perfectly built they may be, in town or country. Annual lime white-washing, an old custom, is decidedly a wholesome precaution, and every cellar should be thus treated, especially in the autumn, as the cellar will be kept closed more than in spring and summer.

WHAT the plumber wants is the opportunity to furnish good plumbing. If every person were educated up to the necessity of this, there would be no trouble, but as this is not the case, rules and regulations must be provided to secure it.

MASTER PLUMBERS AND LABOR UNIONS.

The matter at issue between the master plumbers and the journeymen at Indianapolis, as we understand it, is the recognition of federated trades. The trouble is not caused by any matter that comes properly within the jurisdiction of the master plumbers. Circumstances altogether outside of plumbing interests are the cause of the trouble. The matter stands this way: The journeymen have a union, and other trades likewise have similar organizations. These different trades have formed a federation and the members are pledged not to work with any one who is not in the federation of trades. For instance, a journeyman plumber will not work on a job in a house in which a paper hanger, painter, carpenter, or any other is working who does not belong to the federation. The only thing at issue seems to be the recognition of all these unions by the master plumbers. The master plumbers recognize the journeymen's union freely, but when they are asked to go outside their trade to deal with matters altogether foreign to their interests, and to recognize and treat with Tom, Dick and Harry, they properly call a halt and refuse to recognize any obligations to outsiders.

The unjustness of such a principle is apparent. If unions outside the trade are to be treated with at the expense of the control of the employers' interests, where are the employers to draw the line? What trades shall be recognized? If the principle is recognized at all, it can have no end. Every little band of persons, street sweepers, servants, idiots and lunatics could have the same right to go along down the line and make their demands of the master plumbers. It simply places the master plumbers under the burden of matters over which they can have no possible control. Other firms in other trades with which they do not in any way affiliate, between which there is no commonality of interests, can, by the employment of one man, bar any master plumber from entering upon the plumbing of any house. It is altogether unreasonable, unjust and repugnant to all sense of right and a block in the wheels of industrial progress. It is the most direct course the journeymen could have taken to drive public sentiment from them and forfeit all sympathy.

If there be not other causes than those above the surface, we cannot see how the journeymen's cause can be sustained before the great tribunal of public opinion. Such affairs are to be deeply regretted. We cannot go so far as to intimate that the action of the employes is malicious or intentionally wrong. They are misled. They no doubt have been induced to take this step believing it is just and right. The error lies in the misconception of the fundamental principles on which rests all business and the true progress of all industry. Recognition and advancement are won, not forced. Merit is rewarded, not stubborn resistance to business prosperity. The employe who neglects his employer's interests is in danger of swift failure, but the one who makes war on his employer, injures or ruins his business, cannot hope to find favor or come in touch with the helpful reciprocal relations that should exist between employer and employed.

The adage is, "in union there is strength," but it depends altogether on the kind of union and the purposes for which its strength is exerted. Strength in the wrong is weakness, and its calamities are accumulative. Men cannot carry men on their shoulders and be swift in the race. The plumber cannot carry the mason, carpenter, plasterer, painter, and all such, and win the prize he otherwise could attain. His interests are separated from theirs as widely as their trades are dissimilar. To make the employer of the one responsible for the employe of another is as absurd as it is unjust.

The journeymen plumbers are holding their employers responsible for that which they have no means of preventing. The master plumber, for instance, cannot say what kind of men the master painters or the boss carpenters shall employ. They have the right to employ all non-union men if they choose regardless of the wishes of the plumbers. Thus the plumbers cannot prevent non-union men from working on buildings where they are doing plumbing, yet they are called to account by their employes for grievances against employers with whom they have nothing to do. We cannot find any view of this matter that would present it as being in any degree fair or reasonable. One thing, however, we have noticed, and we believe it to be the observation of all, and that is, in all industry where there is the least friction between employes and employers, there the employes are most prosperous.

WHERE THE RESPONSIBILITY RESTS.

At a recent meeting of master and operative plumbers held at Glasgow, the chairman, in his address, stated this was the first of a series which it was intended to hold in Glasgow and the West of Scotland, with the object of spreading information among the public, and also among the members of the trade, as to the importance of good, honest, skillfully done work; and he explained how it was important both for the public and the members of the trade that every master and man engaged in this important craft should possess such qualifications as would enable him to put work out of his hands which would be safe and satisfactory to all concerned. The public were entitled to the maximum of possible safety consistent with the condition of things as existing at the time. The speaker proceeded to divide the responsibility for the public safety between three sets of people, namely—first, proprietors of property; second, the public authorities; and third, the plumbing trade. Under the first of these heads he referred to the fact that tenants were not careful when taking a house to inquire as to its sanitary condition. They were generally not only ignorant of the real nature of the danger thus lurking, but were equally ignorant of what were the means necessary to avert it. Even medical men were often slow to apprehend the invisible link between sewer gas and disease. When illness appeared in the family, the sanitary authorities were called in and everything was found wrong. The alterations ordered were carried out, and the landlord, calmly folding his arms, waited for another outbreak. He contended that landlords should take upon themselves the initiative of discovering the condition of their own properties. The plumber was connected with the issues of life and health in a way so closely that we could not safely leave him to struggle along as we might do the shoemaker or the bookbinder. In the case of the latter defects at once declared themselves, but in that of the plumber he wished protection against all the dangers of our modern sanitary system, and this protection the public must somehow get. But the question rose, how was safety and security to be got, to which the public were entitled? He answered, by a clear and distinct fixing of responsibility on the right shoulders, and by giving the necessary powers to carry out these responsibilities.

Here is the point to the whole matter, and it is as appliciable to this country as to any other. Let the responsibility be once fixed and the necessary powers granted to secure the discharge of these responsibilities, and the solution of the problem will become comparatively easy. The trouble will probably lie in fixing the responsibility. Every body is ready to place that responsibility on the shoulders of the plumbers alone, and there rest the whole matter. But this is not right; and does not go to the bottom of the matter. The plumbers in this country have long ago accepted their full share of the responsibility in the important matter of plumbing, and have worked hard to be empowered to discharge that responsibility as they have fully presented it to almost every municipal government in the country. They have discharged this duty as far as they have been permitted so to do by the authorities, and a great responsibility now rests on the latter. Almost every day brings us information of some city council or state legislature or some officials standing in the way of plumbers and the proper sanitary drainage of human habitations. The people do not comprehend the full importance of plumbing, and some legal authority is required to secure the proper kind. So long as property owners are allowed to construct cheap homes, of poor material and bad construction, so long will the authorities be responsible for the poor sanitary conditions that will result. The plumber cannot insist on doing work in a certain way so long as the law allows the builder to have it done as he pleases, but when the law requires a certain quality of plumbing work to be done, both the plumber and the builder are directed in the work, and their responsibility cannot be evaded in any manner unless it be through a lax administration or enforcement of the law.

The plumbers were first to take steps in the matter of procuring sanitary plumbing, and they have wonderfully progressed in this direction despite the opposition they have met by officials

and law makers who should have given them every encouragement and aid. If we were obliged to put our fingers upon the persons on whom this responsibility rests to-day, we would have to put one finger on municipal authorities and lawmakers and another on building owners.

NOTES AND NEWS.

The next meeting of the National Electric Light Association will be held at Montreal, Aug. 25, 26 and 27.

It is found that the "sparkling," visible when switches are turned on or off—to say nothing of that seen at dynamo brushes—will ignite the ordinary vapor given off by petroleum.

Look out for increasing corrosion! More coal, less power. That's what it means. It also means that something is going to happen.—The Safety Valve.

The electric arc is composed of a steam of vapor arising from the actual boiling or vaporization of the solid or fused ends of the separated conductors.

The number of medical practitioners in Paris is stated to be 2,200. As the population of the French capital is 2,300,000, this gives a proportion of one medical man to about every 1,000 inhabitants.

The authorities of the Ohio penitentiary have been using an electric shock for the purpose of punishing inmates. A legislative committee investigated, but did not find that any atrocities had been committed.

The Forty-second Session of the American Medical Association will be held in Washington, D. C., on Tuesday, Wednesday, Thursday, and Friday, May 5th, 6th, 7th, and 8th, commencing on Tuesday at 11 o'clock, A. M.

Mica, which stands unique among minerals as an insulating substance, is destined to become one of Connecticut's leading products. Three new mines have recently been discovered in that state.

Always have your boiler covered with non-conducting material, no matter how cheap your fuel may be.—The Safety Valve.

The sixteenth annual meeting of the American Academy of Medicine will be held at Washington, D. C., May 2 and 4, opening at 3 P. M. May 2. As it will be just previous to the sessions of the American Medical Association, members will be able to attend both meetings.

One of the latest proposed applications of electricity is a policeman's club that contains a galvanic battery. When the rowdy seizes the club, thinking to wrest it from the policeman, the rowdy receives an electric shock, which astonishes and paralyzes him, rendering his capture easy.

The engineering school of Arras, France, is at present engaged on experiments with melinite, with a view to finding out the charges of that explosive necessary for the breaking of iron beams and the determination of the formulæ of those charges.

A timely suggestion has been offered by a German physician that the date of original preservation be stamped upon each and every can or package containing meat foods. It is held that preserved meats, hermetically sealed, may remain wholesome for a year or so, but that there is danger in the use of such foods after this period.

A remarkable discovery has recently been made near Ooalaska, Alaska,—coal transformed into coke solely by the forces of nature. The locality has been taken up by the steamship company. So positively assured is the company of the extent of the deposit that it has undertaken to supply the local demand, in addition to furnishing during future seasons fuel not only for its own steamers but also for those of the government service.—Trade and Mining Review.

A new mineral oil as thick as butter has been introduced as a lubricator by the Campagnie Francaise de Graisses Minerals Consistantes. It is stated to be free from acid, resin or drying oils, and does not alter with exposure to the air. Its melting point is 84 deg. C. C., and it does not inflame at a lower temperature than 220 deg. C. While it resembles butter in color, it is odorless, and has no chemical action on metals.

It is hard to understand the present action of Western builders in substituting steel for cast iron columns. Cast iron stands a greater crushing strain than steel—more than twice as much—it does not corrode as quickly as steel, possesses more than double the supporting strength of steel, and last it does not cost more than half as much.—The Safety Valve.

The National Association of Railway Surgeons will convene at Buffalo, N. Y., Thursday, April 30, 1891. This is a change of one week from the time previously announced, the change having been made so as not to conflict with the dates covered by the meeting of the American Medical Association.

The New South Wales Miners' Eight Hour Bill is rather startling in its provisions. It enacts that any coal miner in the colony who works at his calling for more than eight hours out of the 24, on any of the first five days of the week, or for more than six or seven hours on alternate Saturdays, will commit an offense, for which the party employing him will be held responsible. However, there is nothing like doing things thoroughly.—Invention, London.

Never, perhaps, has the direct relation between death and overcrowding been more strikingly presented than in a little table compiled by Mr. C. Roberts, and included in an article by him in the new paper entitled *Physique*. It relates to the sanitary districts of London, and shows, among other suggestive facts, that whereas in Hampstead, where the allowance of space is 180 square yards to every inhabitant, the death rate is only 10.5 per thousand per annum, in the Bethnal Green condemned district, where the allowance is 13 square yards only per person, the death rate is just 40 per thousand.

The Ladies' National Health Protective Association has been incorporated at Washington, D. C. The directors for the first year are Clara Barton, Jane H. Spofford, Alice C. Fletcher, and Emily L. Sherwood, of the District of Columbia; Margaret W. Ravenhille, Fannie J. Helmuth, and M. Louise Thomas, of New York. The objects of the association are to protect the health of the people of the United States by taking such action from time to time as may secure the enforcement of existing sanitary laws and regulations by inviting the attention of the proper authorities to any violation thereof, and to procure the amendments of such laws and regulations when they shall be found inefficient for the prevention of acts injurious to the public health; and to co-operate with the health officials of the United States and the various states and cities.

OUR SANITARY NEEDS.

Volumes have been written on the subject of sanitary science, and the best sanitary engineers in the world have exhausted their ingenuity and resources in the effort to devise means whereby a large city can be purified of the noxious effluvia emanating from the public sewers and cess-pools into which the filth and scourings that, unconfined and allowed to decompose, are such a grave menace to the health of the inhabitants. Theories have been as plentiful as the sands of the sea, but there have been few that have borne the test of practical application. Sanitary engineering is yet in its infancy, although great advancement has been made of late years in the direction of scientific accuracy.

Few denizens of a great city appreciate the difficulties that lie in the path of those charged with the duty of cleansing the city of the impurities that menace the health of the citizen. It is frequently regarded as a personal affront for an officer to notify a house holder to cleanse his premises, and many nuisances are maintained for the simple reason that neighbors of those guilty creating them are fearful of incurring the enmity of the derelict parties by making a formal complaint to the proper authorities. The health department is often blamed for the existence of nuisance of which it has no knowledge.

Its officers have no legal right to enter a private domicile or private grounds unless formal complaint is lodged against the offending premises. This fact should be generally known, and understood. It is seldom if ever that, when properly notified, the department fails to enforce the law.

In regard to the drainage and ventilation of buildings the department labors under the disadvantage of having few practical builders and plumbers in its employ. This fact is due to the im

perfections of the law and the lack of the necessary funds to pay such assistance. The law should be imperative in requiring that at least one-half the sanitary inspectors should be men educated in the science of sanitary engineering, competent to erect and fit a building on principles which render the accumulation of noxious gases impossible, and which shall insure to the occupant an abundance of fresh, pure air at all seasons and all hours of the day and night. These inspectors should be empowered with the legal authority to enforce their plans, and a failure to comply with their order should be made punishable by heavy fine.

I am convinced that a large majority of our property owners would cheerfully comply with all reasonable requirements of the Department of Health in this regard. Self-interest, if no more laudable motive, would impel such a course. A poorly drained or ventilated house or tenement should be labelled as dangerous just as houses are now placarded where contagious or infectious diseases exist. By making it unprofitable for landlords to permit their houses to fall into an unsanitary condition the authorities could easily work a reform in the matter of construction of human habitations.

I trust that I am not too persistent in directing attention to this subject. I am deeply impressed with its importance, not only at the present time, but in the future, when our population shall have doubled or trebled. If the foundation of perfect sanitation shall be well laid, the superstructure will of necessity be stable and symmetrical. If, on the contrary, we neglect the primary work of sanitation, the consequences may be dire and irremediable. Chicago should assert her pre-eminence as a health center as she has already asserted her superiority in commerce, manufactures and trade, and her future will be as glorious as her past has been marvelous and unparalleled. Let our citizens co-operate with the Department of Health, and let the Common Council grant the sinews of war, and Chicago will take the place in the sisterhood of cities to which she is justly entitled, on account of her geographical position, and by reason of her rank as the foremost city in the West in commerce, manufactures, and the useful and polite arts. All elements of our population should unite in one common effort toward attaining results so desirable at the present and so necessary in the future.

Andrew Young.

THE ROCHESTER, N. Y., MASTER PLUMBERS' ASSOCIATION.

The Master Plumbers' Association of this city was first organized in the fall of 1885. At this time the plumbers thought it would be the proper thing to secure the appointment on the Board of Health of one of their own number, a thoroughly practical man who knew what was required, in order to have the plumbing of the city keep pace with the progress of the age. They decided that in the person of J. Henry Howe they had the one they wanted; he was appointed on the Board, and has remained there ever since.

Then, in 1886, a local act was pushed through the State Legislature governing the plumbing and drainage of all buildings in the city. This act went into effect on the 1st of June, 1886, with a practical plumber for inspector, and the necessary rules and regulations to give force to the same. At this time we had no regular rooms for our meetings, but used to meet at the call of the president at such time and place as he might designate. At that time the famous circular was issued whereby the craft of this city resolved to refuse all sub-contracts and to estimate with none but owner or architect.

The organization now dragged along until the spring of 1888, when it secured rooms in the Builders' Exchange, joined the National Association and again became a live organization; sent delegates to the Boston Convention, also to Pittsburg and Denver. Immediately on re-organization in 1888, we started in to improve the quality of the plumbing done in the city by having a committee appear before the Executive Board who have entire control of the water-works and issue all plumbers licenses, and they were requested to refuse to grant licenses except to duly qualified plumbers having a regular place of business. In order to ascertain who were duly qualified the committee insisted upon having a standing Examining Board appointed, which was granted. This Board consists of the president of the master plumbers' association, the Chief Inspector of Plumbing of the Health Board, and the Chief Engineer of the Water Department, to whom all applications for license are referred for examination, and license is granted only on a favorable report from the Board.

The association at the present time is in a flourishing condition, having in its ranks every master plumber in the city. The Baltimore Resolutions are strictly lived up to, and the trade here purchase goods only from those houses who protect the trade.

The following are the officers, elected on the 6th of February: President, W. G. Reid; Vice-president, W. T. Fox; Treasurer, J. A. Barr; Recording Secretary, A. A. Dumond; Financial Secretary, Chas. J. Stephany; Correspondent Secretary, George Hennegan; Sergeant-at-Arms, John Walsh. This organization meets at the Builders' Exchange on the evening of the first and third Fridays of each month. The annual meeting is held the first Friday in February of each year.

LIST OF MEMBERS:

Barr & Creelman, Barr Brothers, Bascom & Morgan, R. Bennett, A. Casebeer, J. P. Dailey, G. E. Dodds, R. H. Dukelow, F. Dumond & Son, F. B. Fitzsimonds, T. W. Ford, George T. Foster, John F. Fox, W. T. Fox, John Hargather, Hart & Handell, George Hennegan, Howe & Bassett, W. J. Kewin, Maher & Glasgow, O'Connor & Lennon, George W. Page, W. G. Reid, Rice Brothers, E. Rodenbeck, Shaughnessy Brothers, J. A. Spencer, Smith & Oberst, C. J. Stephany, Tanner & Rosney, F. R. Walker, John Walsh, W. G. Widman.

Following are the Commissioners of the Board of Health: Hon. C. R. Parsons, President; E. B. Chace, Matthias Kondolf, Jas. O. Howard, T. J. Derrick, Dr. Chas. Buckley, J. Henry Howe, Dr. J. J. A. Burke, Health Officer; Peter Sheridan, Clerk; D. C. Smith, Inspector of Plumbing.

W. G. REID.

The subject of this sketch, Mr. W. G. Reid, hails from bonnie Scotland, having been born in Aberdeen, Scotland, March 16, 1842. He was brought by his parents to Rochester, N. Y., in the spring of 1850 being then a lad of eight years. At the age of sixteen, that is in the spring of 1858, he was apprenticed to P. R. Morley who owned the only plumbing shop in Rochester at that time. He left Rochester in 1861 and for a time saw pretty much every place in this country. But his life was not an idle or a purposeless, rambling one. Three years of this time was spent in Buffalo, N. Y., three years at ship plumbing in Boston, and four years in the West and South. He returned to Rochester in 1872 and worked for the firm of Boyd & Hart for ten years, and then went into business for himself, and from that time to the present has had no reason to complain of the business success that has attended his efforts.

He was an energetic, progressive plumber, kept pace with the progress of the age, and was one of the founders of the Rochester Association of Master Plumbers, and bears the high honor of being its president ever since its foundation. At every election he entered a protest to a re-election, but the members of the association, seeing in him the proper material for their executive officer, called him to the president's chair where he has ably performed the duties of that office. His reputation went beyond the bounds of his local association, and he was called to serve the National Association of Master Plumbers as its Vice-president for two years—1888 and 1889—and he is at present a member of the Executive Committee of that association.

This is a brief sketch of an active life which might be elaborated into a volume and contain much interesting reading. We present above his picture and take the liberty of complimenting him on his fine appearance.

REGISTRATION OF PLUMBERS.

An act to secure the registration of Plumbers and the Supervision of Plumbing and Draining in the City of Rochester. Passed May 17th, 1886: *The people of the State of New York, represented in Senate and Assembly, do enact as follows:*

Section 1. On or before the first day of June, 1886, every plumber carrying on his trade in the City of Rochester shall, under such rules and regulations as the Board of Health of the said City of Rochester shall prescribe, register his name and address with the Clerk of the Board of Health of said city; and after said date it shall not be lawful for any person to carry on the trade of plumber in said city unless his name is registered as above provided.

2. A list of the registered plumbers in the City of Rochester shall be published in the newspaper designated by the Common Council to publish the official proceedings of the Boards and Departments of the City of Rochester, at least once in each year.

3. The drainage and plumbing of all buildings, both public and private, erected in the City of Rochester after the first day of June, 1886, shall be executed in accordance with plans previously approved, in writing, by the Board of Health of said city. Suitable drawings and descriptions of said plumbing and drainage shall, in each case, be submitted to the Board of Health of said city, and shall by said Board be placed on file in its office; said Board of Health is also authorized to receive and place on file drawings and descriptions of the plumbing and drainage of buildings erected prior to the passage of this act in said city.

4. The Supreme Court of the State of New York, and County Court of the County of Monroe, or any Judge thereof, shall have power at any time after the service of notice of violation of any of the provisions of this act, and upon affidavit of one of the members of the Board of Health of said city to restrain by injunction order the further progress of any violation named in this act, or any work upon or about the building or premises upon which, or with reference to which said violation exists. Any civil action which may be brought under the provisions of this act, shall be brought in the name of the City of Rochester as plaintiff, and it shall be the duty of the City Attorney of said city to commence and prosecute any such civil action upon being directed so to do by resolution of the Board of Health of said city.

5. The Board of Health of the City of Rochester shall have power to adopt such rules and regulations for the registration of plumbers and drainage in the City of Rochester as such Board shall deem proper, but said Board shall not prohibit the use of any material for drainage which is considered suitable and proper for such purposes.

6. Any person violating any of the provisions of this act shall be deemed guilty of a misdemeanor.

7. This act shall take effect immediately.

RULES AND REGULATIONS.

Rule I. Every plumber engaged in business in the City of Rochester shall appear in person at the Health Department and register his name and address, with the Clerk of the Board of Health, pursuant to the provisions of Chapter 402, Laws of 1886, upon the forms prescribed by the Health Department.

OF PLUMBING.

The Law requires that the plumbing and drainage of all buildings, public and private, shall be executed in accordance with plans and specifications previously approved in writing by the Board of Health; and that suitable drawings and descriptions of the said plumbing and draining shall, in each case, be submitted and placed on file in the Health Department.

Blank abstracts of the specifications for plumbing and drainage will be furnished to architects and others, on application at the Board of Health office.

As the law requires that the plumbing and drainage to be executed according to a plan approved by the Board of Health, no part of the work shall be covered or concealed in any way until after it has been examined by an Inspector of Plumbing of the Board of Health; and notice must be sent to the Board when the work is sufficiently advanced for such inspection.

In case the Inspector of Plumbing shall respond to an application for an inspection at or later than the hour named in the notice and said Inspector shall be delayed on account of the work not being ready, or it shall be necessary for the Inspector to make another trip to inspect said work, the plumber will be required to pay 50 cents for such delay if it shall exceed fifteen minutes, and each additional trip one dollar, unless said delay shall be caused by unavoidable accident in the performance of the work, in which case no extra charge shall be made as aforesaid, and that the license of the plumber be suspended until such time as the fine shall be paid.

No application for an inspection will be received unless accompanied with abstract fully made out.

After a plan has been approved, no alteration of the same shall be allowed except on the written application of the owner or agent.

PLAN OF DRAINAGE AND PLUMBING APPROVED BY THE BOARD OF HEALTH.

1. All materials must be of good quality and free from defects; the work must be executed in a thorough and workmanlike manner.

2. The drain, soil, waste, back air pipes and the traps must, if practicable, be exposed to view for ready inspection at all times, and for convenience in repairing. When necessarily placed within partitions or in recesses of walls, soil and waste pipes must be covered with woodwork so fastened with screws as to be readily removed. In no case shall they be absolutely inaccessible.

Shafts not less than three square feet in area are required in tenement houses, to ventilate interior water closets, or in a manner designated by the Inspector of Plumbing, subject to the approval of this Board.

3. Every house or block of buildings must be separately and independently connected with the street sewer.

4. Where there is no properly constructed or available sewer in the street, and it is necessary to construct a private sewer to connect with a sewer on an adjacent street or avenue, application must be made to this Board for permission so to do.

5. The house-drain must be of iron or tile pipe of good material, with a fall of at least one-quarter inch to the foot.

6. If of iron, it must be hung on the cellar wall or ceiling, unless this is impracticable, in which case it must be laid in a trench cut at a uniform grade, provided with necessary hand holes covered with brass screw ferrules.

7. It must be laid in a straight line, if possible. All changes in direction must be made with curved pipes, and all connections with Y-branch pipes and one-eighth bends.

8. Any house-drain or house-sewer put in and covered without due notice to the Health Department, must be uncovered for inspection at the direction of the Inspector.

9. A running or half S trap must be placed on the house-drain at an accessible point near the front of the house. This trap must be furnished with a hand-hole for convenience in cleaning, the cover of which must be properly fitted and made gas and air tight with some proper cement.

10. There must be an inlet for fresh air entering the drain just inside the trap, of at least four inches in diameter, leading to the outer air and opening at or near the street curb, provided with a suitable cap and extend 12 inches above grade.

11. No brick, sheet-metal, earthenware, or chimney flue shall be used as a sewer-ventilator, nor to ventilate any trap, drain, soil or waste pipe.

12. Every vertical soil pipe and waste pipe must be of iron,

and where it receives the discharge of fixtures on two or more floors it must be extended at least two feet above the roof of undiminished size, with open or basket end. It must not open near a window nor an air-shaft which ventilates living rooms.

13. Soil, waste and vent pipes in an extension must be extended above the roof of the main building when otherwise they would open within twenty feet of the windows of the main house or the adjoining house.

14. The minimum diameter of soil pipe permitted is four inches. A vertical waste pipe, into which a line of kitchen sinks discharge, must be at least two inches in diameter, with one inch and a half branches.

15. Where lead pipe is used to connect fixtures with vertical soil or waste pipes, or to connect traps with vertical vent pipes, it must not be lighter than D pipe.

16. All iron pipes must be sound, free from holes and of a uniform thickness of not less than one-eight of an inch for a diameter of two, three or four inches, or five-thirty-seconds of an inch for a diameter of five or six inches; and in case the building is over sixty-five feet in height above the curb, the use of what is known as Extra Heavy Pipe and corresponding fittings are required.

17. Before they are connected they must be thoroughly coated inside and outside with coal-tar pitch, applied hot, or some other equivalent substance.

18. When required by a Plumbing Inspector from the Board of Health, all soil, waste, vent and water leaders must be tested with the water test, by the plumber in the presence of the Plumbing Inspector, and all defective joints made tight, and other openings made impemeable to gases. Defective pipe discovered must be removed and replaced by sound pipe. Stop cocks shall be placed at the foot of the vertical soil or waste pipes for the convenience of the Plumbing Inspector.

19. All joints in the iron drain, soil, waste and water leader pipes must be so caulked with oakum and lead as to make them impermeable to gas.

20. When tile is used for the house drain, it must be laid in a trench cut to a uniform grade and the soil well rammed to prevent settling. The ends of pipe must first be wetted and the space between hub and end of next section of pipe be completely filled with the best quality of hydraulic cement. A scraper or wiper must be used after the cement is applied to each joint and before the next section is laid, to remove any cement that may have been forced into the pipe.

21. All connections of lead with iron pipes must be made with a brass sleeve or ferrule, of the same size as the lead pipe, put in the hub of the branch of the iron pipe and caulked in with lead. The lead pipe must be attached to the ferrule by a wiped or over-cast joint.

22. All connections of lead pipe should be by wiped joints.

23. Every water-closet, urinal, sink basin, wash-tray, bath, and every tub or set of tubs, must be separately and effectively trapped.

24. Traps must be placed as near the fixtures as practicable, and in no case shall a trap be more than two feet from the fixture.

25. In no case shall the waste from a bath tub or other fixture be connected with a water closet trap.

26. Traps must be protected from siphonage by a special air pipe taken out of the crown of trap, in no case less than two inches in diameter, for water closet traps, and one inch and a quarter for other traps.

27. The vertical vent pipes for traps of water-closets in buildings more than four stories in height must be at least three inches in diameter, with two inch branches to each trap, and for traps of other fixtures not less than two inches in diameter, with branches one and a half inches in diameter, unless the trap is smaller, in which case the diameter of branch vent pipe must be at least equal to the diameter of the trap.

28. In all cases vent pipes must be of cast or wrought iron and connected to traps with brass soldering unions.

29. These pipes must be carried up two feet above the roof, the extension to be not less than four inches in diameter to avoid obstruction from frosts or they may be branched into a soil-pipe above the inlet from the highest fixture. They may be combined by branching together those which serve several traps. These air pipes must always have a continuous slope to avoid collecting water by condensation. In no case will they be allowed to be carried down from fixture except where the condition will not permit of them being carried up. In all cases where practical the back air pipe from trap must be carried up to the floor above fixture.

30. Every safe under a wash-basin, bath, water-closet, or other fixture must be drained by a special pipe not directly connected with any soil-pipe, waste-pipe, drain or sewer, but discharging into an open sink, upon the cellar floor, or outside the house.

31. The waste-pipe from a refrigerator shall not be directly connected with soil or waste pipe, or with the drain or sewer; it should discharge into an open sink. Such waste-pipes should be so arranged as to admit of frequent flushing, and should be as short as possible and disconnected from the refrigerator.

32. All water-closets within the house must be supplied with water from main supply or tank of sufficient size located above the same. A group of closets may be supplied from one tank. But water-closets on different floors are not permitted to be flushed from one tank.

33. When closets are supplied from tanks, the pipe to closet shall in no case be less than 1¼ inch in diameter.

34. Rain-water leaders must never be used as soil, waste or vent pipes; nor shall any soil, waste or vent pipe be used as a leader.

35. When within the house, the leader must be of cast iron, with leaded joints, and tested with the water test in the presence of the inspector. In every case where a leader opens near a window or a light shaft, it must be properly trapped at its base.

36. No steam exhaust or blow-off pipe from a steam boiler will be allowed to connect with any soil or waste pipe, or directly with the house-drain. They should discharge into a tank or condenser the waste from which, if to be discharged into the sewer through the house-drain, must be connected on the sewer side of the running trap.

37. Subsoil drains must be provided whenever necessary.

38. Yards and areas should always be properly graded, cemented, flagged or well paved, and properly drained; when the drain is connected with the house-drain, it must be effectively trapped. Front area drains must, where practicable, be connected with the house-drain inside of the running trap.

39. Cellar and foundation walls must where possible, be rendered impervious to dampness, and the use of asphaltum or coal-tar pitch in addition to hydraulic cement is recommended for that purpose.

40. No privy vault or school sink will be allowed in any cellar or basement; nor shall the general privy accommodation of a tenement or lodging house be allowed to be in the cellar or basement.

41. School sinks must be of cast iron, not more than two feet in depth, connected at the upper end with the water supply, and at the lower end with a drain leading to the street-sewer, and provided with an outlet at the lowest point and on the bottom so as to admit of a complete discharge of the contents whenever the outlet is opened and the sink flushed with water.

42. When a privy vault or cesspool must necessarily be used, and the water supply of the premises is from a well, they must be at least fifty feet from the well; and the privy vault must be absolutely tight.

43. Pan closets are strictly prohibited.

All connections between water closets and soil pipe shall be made with lead connections and ferrules.

When more than one trap is to be connected to a vent pipe, the branches must be taken out of the main vent above the height of the fixture.

ELECTRIC LIGHT WIRING INSTALLATIONS FROM A MECHANICAL STANDPOINT.

Augustus Noll, in discussing this question in *Architecture and Building*, says:

The question is frequently asked by architects and owners of buildings, "Can electric lights be installed with safety from fire, and will the installation give results that are satisfactory and permanent?"

The improvements made recently in materials and methods admit of answering in the affirmative.

Nearly all the troubles in electric lighting plants have been caused by defective wiring, and on that part of the lighting system, more than any other, depends the success of future service.

It may not be amiss to compare the early date of the art of electric light wiring with the present and the probably future advancement in the methods of installation.

In the early days of electric lighting, a wire covered with cotton and saturated with paraffine was used; this in a short time was replaced by a wire covered with cotton and white lead, known as "Underwriter's wire." The insulation was supposed to be fireproof, and on that account decreased the chances of fire. While the insulation was non-inflammable, it also readily absorbed moisture, which caused excessive leakage and some incipient fire. A few carefully conducted tests and experiments proved that "protection against moisture was prevention of fire;" and henceforth a moisture-proof wire was demanded, and the manufacturers in that line now offer us such high grade insulations as "Grimshaw White Core," "Okonite," and others.

Improvements in the method of installing the wires were also made; formerly buildings in the course of erection were equipped with the fire-proof insulated wire incased in wood molding, or inserted in zinc or lead tubes, but with the appearance of the moisture-proof insulated wire the former insulation was discarded for the latter, and instead of inserting the wire in zinc and lead tubes it was fastened directly to the side walls and ceilings, and covered by plaster. The cut-outs and switches are now mounted on porcelain and slate instead of wood, as formerly, and more attention is given to the equalization of electrical pressure on conductors.

While these changes helped to improve the work, it was still a matter of chance that wires placed in a new building and imbedded in plaster give satisfactory results; conditions that could not be controlled increased the difficulties. A cut from the plasterer's trowel or a blow from a hammer on the insulation destroyed its utility; and, though the wires might be tested, the fault, in some cases, would not appear till the building was completed, when, to remedy the defect, it was necessary to cut the plaster to obtain access to the wires, or discard the faulty circuits and rewire on the surface of the plaster, in either case disfiguring the walls and causing extreme annoyance. Again, should changes be contemplated in the wiring, such as an increase of lights on different outlets, or a change to a lighting system where lamps of a lower voltage are used, the workman was confronted by inaccessible wires, and, to make the changes required, was forced to have recourse to the same expedients as stated before, and with the same results.

Although wiring installations give better results than formerly, there was yet a large field for improvement; access to the conductors became absolutely necessary for controlling the system, making changes and rectifying defects which might occur after the work is finished and the building completed, and this without cutting or defacing the walls, or interfering with the other portion of the lighting system.

It is evident that as long as the conductors are inaccessible, just so long will the results be uncertain; and as it is the purpose to eliminate the objectionable features, and secure a wiring system that possesses accessibility and freedom from fire and leakage, the question is, "What is necessary?" To which reply is made: A high grade moisture-proof insulated wire, together with a system of "raceways" or conduits, and a complete line of "fishing" or junction boxes.

The conduits should be of ample size, with smooth inner surface, so that wires can be easily inserted or withdrawn; they should be constructed of materials that will not stain or exude through plaster or paint, should be non-combustible and moisture-proof, and upon which the action of lime or cement, or extreme variations of temperature, should have no effect.

The "fishing" or junction boxes should be equipped with shoulders or sockets for the entrance of the tubes, thereby making them a part of the conduit system, and preserving the continuity which is so essential in a system of this kind, and also enabling us to make the joints moisture-proof.

All cut-outs when single or in groups should be located in the junction boxes.

The conduits should be installed in a workmanlike manner; they should not be run or looped from one outlet to another, but branches should be led to each outlet from the main conduit carrying the wire for that circuit, and at right angles with the same. At the intersection of the branch and main conduit a "fishing" box should be placed. The main conduits may be located in the cornice near the ceiling or behind the baseboard at the floor, with the cover of the junction box flush with the surface, thus keeping them out of sight and at the same time easy of access. The location of the conduits should be uniform on the different floors throughout the building.

An extra covering of metal should be placed on the conduits at the outlets, to keep them securely fastened to the wall, protect the ends and take off the strain when inserting or withdrawing wires.

With a proper conduit and a complete system of junction boxes, it becomes unnecessary to insert a single wire (with the exception of the main feeders) until after the installation of conduits is complete and the building finished; the insertion of strings or drawing lines is equally unnecessary, for, should the string or wire break near the middle of its length, that circuit would be as inaccessible as though it was imbedded directly in the plaster.

The main wires can be inserted in the conduits at the time of installing the same, and placed in recesses in the walls, the cover of the recess to be detachable.

In hotels, apartment houses, office buildings and other structures used for similar purposes, the largest part of the wires and conduits, together with the cut-outs and junction boxes, can be located in the halls, so that in case of alterations or additions being required, the occupants of the rooms will not be annoyed.

Considering the advantages a wiring system of this kind possesses over previous methods, a comparison in cost will be favorable to the conduit system.

The indefinite manner in which electric light wires are sometimes installed has often placed the owner of a building who contemplates changes at the mercy of the company or contractors under whose supervision the work was installed. They in turn delegate the foreman who had charge of the work in that particular building to attend to the changes required, and he usually tries to obtain the services of some of the wiremen who worked on the installation, because "they know where the wires lay."

It is apparent that the employment of a complete conduit system obviates these troubles, and also that instead of equipping a building with a wiring system suitable only for a special company's system of lighting, it can be fitted with conduits for electric lighting, regardless of system, and, in fact, similar to piping the building for gas; and should a change in system be desired in the future where lamps of a lower voltage are used, the change can be made without cutting or defacing the walls, and at a nominal cost, whereas, should this change be required in a building where the wires are imbedded in plaster, it would practically necessitate the rewiring of the entire plant, and at a cost at least equal to that of the original work.

While a conduit of good insulation is necessary, it should not be regarded as extra insulation or protection, to an extent where the insulation directly on the wire is decreased; it should only be treated as a medium to accessibility. "Prevention is better than cure," and for that reason only one wire should be placed in a conduit. Although the fusible metal cut-out will usually break the circuit in case of a "cross," still it is safer to guard against any information of this nature by placing each wire in a separate tube than to invite it by insufficiently insulated wire or inserting wires of different polarity in the same tube. Only the best is good enough, and will in the end be the cheapest for all branches of electric lighting.

The co-operation of architects is not only desirable but necessary for the future advancement of electric light installation work, and to their credit be it said that they are ever ready to extend their help; already have their suggestions been of value, and should the necessity of securing separate recesses be explained, they will, without doubt, make provision for the work similar to that made for gas, steam and water pipes.

THE PLUMBERS' IDYL.

(Respectfully dedicated to the St. Paul M. P. A.)

The spring has come, the plumbers are mum,
There is nothing now to do;
So we'll all keep dumb, no more we'll plumb
Till the spring of '92.

House bill seventy-five is more dead than alive;
It hardly will pull through,
The members there solemnly swear,
Till the spring of '92.

Keep a stiff upper lip, don't give up the ship,—
Faint heart ne'er won fair lass;
Don't sigh or cry, and say oh, my!
For the bill has come to pass.

Local Vent.

CONVENIENT TO HAVE ABOUT.

Oil cans made of copper or zinc are best for use about electrical apparatus.

Two coats of linseed oil make the best varnish for new copper work. The first coat should be thoroughly dry before the second one is put on.

A wet silk handkerchief, tied without folding over the face, is a complete security against suffocation from smoke; It permits free breathing and at the same time excludes the smoke from the lungs.

Dresses may be rendered incombustible by dipping them in a solution of tungstate of soda, one pound in two gallons of water. The most delicate color will not be affected by it.

Experiment has proved that, if a delicate piece of lace be placed between an iron plate and a disk of gunpowder, and the latter be detonated, the lace will be annihilated, but its impression will be clearly stamped on the iron.

To detect fecal matter in drinking water, Griess recommends a feebly alkaline solution of para-diazo-benzol-sulphuric acid, which, with water contaminated as indicated, will produce a yellow discoloration within five minutes.—*Plumber and Decorator.*

In painting ironwork exposed to wind and rain, take, says the *Mechanical World*, red oxide of iron, ground in oil, and mix it with equal parts of boiled linseed oil and turpentine, add 1 oz. patent dryers to the pound. This is said to be a good paint for the purpose.

A process of making artificial cork is by thoroughly incorporating 63 parts ground or powdered cork chips with 180 parts of boiling starch paste. The resulting plastic mass is pressed in forms and then dried in hot rooms.—*Invention, London.*

Linseed oil may be tested by mixing equal parts of oil and nitric acid in a flask, or bottle, shaking well and allowing to stand for about twenty minutes. If the oil is pure the upper stratum of the liquid should be of a straw color and the lower stratum colorless.

A new process for burning coal without smoke has recently been discovered, says an English Exchange. It consists in sprinkling water containing a special preparation of resin over the coal, and the result is that there is no smoke and the glow is as intense as coke.

An ink which, according to the *Effective Advertiser*, seems to be identical with the disappearing ink of about 20 years ago, has recently been placed upon the European market, and is a watery solution of iodide and amylum. It produces a beautiful blue-black writing, which begins to fade after a few days, and disappears entirely after the lapse of a week.

The following is a method to make a paste which will keep: Dissolve a teaspoonful of alum in a quart of water. When cold, stir in as much flour as will give it the consistency of a thick cream, carefully beating up all lumps. Stir in half a teaspoonful of powdered resin. Pour on the mixture a teacupful of boiling water, stirring it well. When it becomes thick, pour in an earthen vessel. Cover and keep in a cool place. When needed for use, take a portion and soften it with warm water. It will last at least a year. If you wish to have a pleasant odor, stir in a few drops of oil of wintergreen or cloves.

The finest grades of razors are so delicate that even the famous Damascus sword blades cannot equal them in texture. It is not generally known that the grain of a Swedish razor is so sensitive that the general direction is changed after a short service. When you buy a fine razor the grain runs from the upper end of the outer point in a diagonal direction toward the handle. Constant strapping will twist the steel until the grain appears to be straight up and down. Subsequent use will drag the grain outward from the edge, so that after steady use for several months the fiber of the steel occupies a position exactly the reverse of that which it did on the day of the purchase. The process also effects the temper of the blade, and when the grain sets from the lower and outer point toward the back, you have a razor which cannot be kept in condition, even by the most conscientious barber. But here's another curious freak that will take place in the same tool: Leave the razor alone for a month or two, and when you take it up you will find that the grain has assumed its first position. The operation can be repeated until the steel is worn through to the back.

HEALTH IN MICHIGAN, MARCH, 1891.

For the month of March, 1891, compared with the preceding month, the reports indicate that measles, whooping cough, inflammation of brain, and cerebro-spinal meningitis increased, and that cholera infantum, dysentery, inflammation of bowels, diphtheria, puerperal fever, typhoid fever, erysipelas and remittent fever decreased in prevalence.

Compared with the preceding month the temperature was slightly higher, the absolute humidity and the relative humidity were nearly the same, the day ozone and the night ozone were slightly less.

Compared with the month of March in the five years 1886-90, membranous croup, inflammation of brain, measles, influenza, cerebro-spinal meningitis and cholera morbus were more prevalent, and small-pox, whooping-cough, puerperal fever, dysentery, cholera infantum, inflammation of bowels, typhoid fever, diphtheria and typho-malarial fever were less prevalent in March, 1890.

For the month of March, 1891, compared with the average for corresponding months in the five years 1886-90, the temperature was slightly lower, the absolute humidity was less, the relative humidity was about the same, the day ozone was less and the night ozone was more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of March, 1891, at fifty-two places; scarlet fever at seventy-eight places; typhoid fever at seventeen places, and measles at ninety-eight places.

Reports from all sources show diphtheria reported at sixteen places less; scarlet fever at fifteen places less; typhoid fever at fifteen places less, and measles thirty-nine places more in the month of March, 1891, than in the preceding month.

Henry B. Baker, Secretary.

Lansing, Michigan, April 2, 1891.

WORDS OF CHEER.

New York, April 1, 1891.—Mr. A. Young. Dear friend: Your kind and very considerate letter received this first day of April, eighteen hundred and ninety-one, and did I not know the heart of the sender I would have thought it a good first of April joke; but knowing well the obstinacy of a Scotchman, as I have a little of that blood in myself, I will take it for granted that it is all right, and you will please accept my thanks for this as well as for many of your kind remembrances to myself and family. I am glad for the paper that it has succeeded in getting such good material at its head, for I know that your able pen will direct its course in the onward direction to the right interest of all sanitary matters of this our great and still growing country; and I say there is no other science which has made such great progress and kept pace with this progressive age, as sanitary science has done, and we can attribute it greatly to the interests of our trade papers and our National Association.

I know the self-sacrifice that you have made in taking charge of this paper must be very great, and I hope you have not withdrawn from the noble work that you have been engaged in for the past few years, as you were at the head of one of the only departments which require a thorough and practical sanitarian.

I have been a subscriber to The Sanitary News I think from its first issue, and I always looked for it with pleasure, as in reading it over I always felt myself very close to some of the warmest and sincerest friends I have; and when I read the account of your proceedings in the Association, I often felt that I should like to be there, and I can assure you that I will look every week for its coming as anxiously as for a letter from an absent friend. I also want to say that for anything I can do to forward the interests of the paper, I hope you will not hesitate to call or demand from me, at any time you may see fit to do so. In regard to the sanitary exhibit at the World's Fair I hope it will be one of the finest ever exhibited in this or any other country.

With kind remembrance to all inquiring friends, and wishing you a heartfelt success in your new and laborious undertaking,

I am fraternally yours,

Joseph A. Macdonald.

FROM ALEXANDER LOWE.

New York, April 6th, 1891.—Andrew Young, Esq: In glancing over the isaue of The Sanitay News of April 4th, in the midst of a very busy time, I could not refrain from snatching a moment to congratulate you on your election to the presidency of the publishing company and also manager of The Sanitary News, when I know so very well that the positions attained have been won by your splendid executive ability and the fearlessness displayed by you as Chief Inspector of the Health Department in the city of Chicago, and the enormous amount of good and solid work that has been done with so small a force of inspectors under you, and such a large territory and population to cover. The eyes of your friends in the east, and especially in this city, have been intently watching you as you steadily kept on the even tenor of your way, and demonstrated more conclusively than ever before, the fact, that the only worthy or proper inspection of plumbing work that amounted to anything or was of real or genuine benefit to owners of property and the public, was the inspection made by thorough and experienced plumbers. When we think of what we have to endure in the way of incompetency and want of knowledge in the large majority of our inspectors, and the unnecessary burdens entailed upon owners and the public, we hope the day may come when the so-called inspection of our city may inspect in the Sanitary and Plumbing Bureau of our Health Department.

Again congratulating you on the recognition that you have so richly earned.

I remain very sincerely and heartily yours,

Alexander Lowe.

P. S. With kindest regards to all my friends of the Chicago Association of Master Plumbers, the banner society, the one that has led the way out. As you used to say: "He who would be free must first himself strike the blow."

PLUMBING NOTES.

The bill in the Wisconsin Legislature providing for the regulation of plumbing, has been killed in the Assembly. No doubt these wise solons think they have done a great thing, but it is only a question of a little time when they will discover what big fools they are.

Gas and Steam Fitters' Union No. 5,225 has embarked in quite an undertaking—interesting the plumbers, gas and steam fitters' unions and associations of the country in the formation of a national organization. In the near future it is proposed to call a convention to form an international union, and locals throughout the country are asked to communicate their views on the most agreeable time and place for holding such a convention to George C. Tarrant, Secretary of Union No. 5,225, of Columbus, Ohio.

There is a strike on among the journeymen plumbers of Providence, R. I. The employers state that some little time ago, they received a notice which bore no signature to the effect that the Plumbers' Union desired that its members should be employed nine hours a day for five days in the week and eight hours a day for the sixth day, with ten hours pay thrown in. No attention was paid to this communication. Finally two plumbers waited on Mr. Cook, of the firm of Cook & Grew, and represented that all the employers had agreed to the new schedule. They begged Mr. Cook to pay them, as they needed the money, and he did so merely as an accommodation. He did not intend to accede to their demands. At a meeting of the master plumbers it was decided to give ten hours pay for nine hours work and double pay for overtime. The tinners and pipers were satisfied with this arrangement which was to go into effect April 1. The plumbers found fault, however, and struck.

The committee on sewerage will recommend to the Council of Milwaukee the adoption of a number of changes in the rules for plumbing. The most important of these is one which hereafter prohibits the use of the old-fashioned lift valves in water closets.

A bill is before the Delaware Legislature providing for the appointment of factory inspectors. The bill is strongly endorsed by business men.

A good plumber's bill is about as good a guarantee of proper domestic sanitary conditions as could be given.

You will find in this issue what the Rochester, N. Y., master plumbers have done and how they stand. It is not bad reading by a long shot. Other associations can see from this the nature of the matter we want for publication regarding them, and we trust it will be forthcoming at an early day. These histories will be good to keep for reference and comparison.

The Milwaukee, Wis., Plumbers' Union have elected the following officers: President, Jerry Hickey; vice-president, W. Grimshaw; treasurer, J. Polacheck; recording secretary, W. S. Nicholson; financial and corresponding secretary, E. H. Mueller.

The Boston Journeymen Plumbers have petitioned the common council praying for an amendment to the ordinances requiring that all traps connected with fixtures or waste from fixtures be supplied with an automatic vent protector at the mouth of vent from crown of trap. In claiming the necessity for this the journeymen offer to go before the council and demonstrate the value of such an arrangement.

The eight-hour day went into effect in Milwaukee, Wis., the first of this month in the plumbing trade.

Despite the fact that March is usually a dull month among manufacturers of house heating apparatus, the Gorton & Lidgerwood Company, New York, have been exceedingly busy. They report an increase of over fifty per cent in the sales of their Gorton house heating boilers this year over the corresponding month in 1890. This is a big jump and speaks volumes for the popularity of their specialty.

Secretary John E. Allen, of the Iowa Master Plumbers' Association, has addressed the following to the members of that organization: We extend to you a cordial and pressing invitation to be with us at our second annual convention of the Iowa Master Plumbers' Association, which will be held in Sioux City, Tuesday and Wednesday, May 5 and 6, 1891. We earnestly request every master plumber of your city to be with us and in attendance. We have good guarantee that President R. Griffith, of the N. A. M. P. U. S., and other distinguished plumbers of the United States, will be with us. It will be the largest gathering of plumbers ever known in the history of Iowa.

The object of this convention is to adopt such measures as will harmonize and mutually protect our interests. Believing your attendance will personally advance the interests of our business you cannot afford to neglect this opportunity. We want to profit by your experience, and want your views and exchange social greetings. How many plumbers can we count on from your city? We must have a full attendance.

The question of apprenticeship has been settled satisfactorily to both employers and journeymen at Pittsburg, Pa. An apprentice will be registered and serve five years, during the last two of which he will be allowed to work on a building without a journeyman.

WHERE PLUMBING IS BEING DONE.

Ashland and June streets, C. C. Breyer; 4943 Atlantic, A. Miller; 44 Bosworth, G. Hauslein; Bonney, cor. Twenty-fourth, J. R. Mills; 611 Baker, A. Miller; 198 Carpenter, G. W. Stokes; 20 Clara Place, Garner & Balin; 252 Chicago Ave., C. C. Breyer; 1340 to 1354 Congress, W. H. Cummins; 327 Clybourn, J. Wallace; 24 Clifton, Bayha & Bachman; 6850 South Chicago, D. Walsh; Congress and Kedzie, J. H. Beane; 139 Cornell, W. J. Miller;

711 Dickson, Geo. Hauslein, Englewood, bet. School and Stewart ave., Lyon & Lee; 1553 Elston ave., Garner & Bahn; 778 Elk Grove, J. T. Bunting; 6519 Emerald ave., Thos. Conway; 943-45-47 Fairfield ave., Harvey & Mose; Forest ave. north of High Ridge Road, Henry Bauer; 173 Forty-seventh, D. W. Burns; 29 Forty-third, D. W. Burns; 539 Flournoy, W. H. Cummins; Fulton and Homan, W. H. Cummins; 6612 Honore, DeWar & Co.; Hoyne cor. Potomac, C. C. Breyer; Indiana near Robey, D. F. Jack; 1130 Kedzie, Garner & Bahn; Kuehl Place, Harvey & Mose; Kingston, D. Walsh; 148 Lytle, J. Walsh; 1409 Lexington, W. H. Cummins; 24 May, Schneider & Broth; Milwaukee ave. and Irving Park, Garner & Bahn; Mead, South of Armitage ave., Garner & Bahn; Maplewood 855-59, Harvey & Mose; 1052 Mariana, Geo. Hauslein; 733 Madison, Sims & Sons; 390 Morgan, I. H. Shannon; Morgan and Lawndale, I. H. Shannon; 5322 Monroe, J. J. Rourke; Michigan ave. near One Hundred-fifteenth, Geo. Pfeifer; Michigan near Sawyer, Geo. Pfeifer; Milwaukee ave. and Carpenter, Wm. Herbst; 556 West North ave., C. C. Breyer; Potomac and Davis, Nelson & Cellhoffen; 5840 Prairie, J. M. Collins; 619 Root, M. Webber; 810 Rockwell, Harvey & Mose; Racine, North of Belmont ave., Geo. Hauslein; Roseland place, Griffiths; 81 Ruble, Dornbos Bros.; Sixty-sixth and Wabash, F. N. Kuhn; 688 Seymour, Harvey & Mose; 72 Seward ave., Bowden; 4452 School, H. Burbach; State and Sixty-seventh, D. Walsh; Seventy-eighth, west of Halsted, Dewar & Co.; 14 Sacramento, W. H. Cummins; Fremont and Wright, Dewar & Co.; Twelfth and Albany ave., Samuel Smith; 3149 Union ave., J. Teutsch; Woodlawn, north of Fifty-fifth, J. Hardin; 1272 Western ave., Geo. Hauslein; 61 Willow, H. Bauer; 7216 Yale, Dewar & Co.

FOR THE DIGESTION.

If it is true that "man wants but little here below," he is generally satisfied.

An old saying has it: "Boys will be boys." This is discouraging to the young America who have ambitions and some hopes of becoming men.

For years the question has been: "What shall we do with our girls?" Teach them what to do with themselves would be a good idea.

"What is the devil?" asked an Austin Sunday school teacher of the new boy who was quite small. "I don't know what it is, but it can't run as fast as my pa can." "How do you know that the devil can't run fast?" "Because I heard pa say he always catches the devil when he comes home late at night from the lodge. I reckon I'll be able to catch it, too, when I get to be as big as pa." "I've no doubt of it," remarked the teacher, with a sigh.—*Siftings.*

Mrs. Inquisitive.—Your husband must be earning more than he used to. I see you have a new sealskin jacket.

Mrs. Straightface.—No, indeed; he's learned how to fix the gas meter.—*Brooklyn Life.*

When all of our flying machines begin to get in operation, some one will get a corner on air.

Plumbers ought to get rich, for they are always looking after the drainage and wastes.

It may be simply a coincidence that the dime saving bank and the closeness of money are contemporary.

Italy has a fruit standing army of about 50,000 men in the United States.—*Washington Star.*

It was probably the man who married a rich wife who first started the joke on the difficulty of finding a woman's pocket.—*Puck.*

"People bore me beyond endurance. Bah! I detest folks," said Lord Tennyson recently to a friend. If this is reliable why doesn't the Laureate write some more sleep poems?—*New York Recorder.*

Teacher.—"Where do we obtain coal, Freddy?" Freddy.—"From the coal beds, ma'am." Teacher.—"Right! Now, Jimmy, where do we obtain feathers?" Jimmy.—"From the feather beds, ma'am."—*The Wasp.*

Tommy.—"Can we play at keeping a store in here, mamma?" Mamma (who has a headache).—"Certainly; but you must be very, very quiet." Tommy.—"Well, we'll pretend we don't advertise."—*Art in Advertising.*

Tommy.—"Paw, what is a holdover senator?" Mr. Figg.—"The qualifications of a holdover senator vary in different states. In Kentucky he is expected to hold over half a gallon without staggering."—*Indianapolis Journal.*

"There is a remarkable example of success," said a Washington man. "Do you refer to the young fellow across the street?" "Yes." "Why, he doesn't look as if he'd have any head for business." "He hasn't. He succeeded to a fortune."—*Washington Post.*

The man who sets his foot on a banana peel and batters his anatomy on the stone pavement, will, in seeking to let not the sun go down on his wrath, have to circumnavigate the earth once in about every twenty-four hours.

Stranger.—Madam, I am a literary man.

She (whose husband is an author).—Sorry, but I haven't any change about me.

Newly-made widow.—He is a fashionable undertaker, but even his charges are far below what I can afford, and I want to give my husband the most expensive funeral I can, you know.

The friend.—Why don't you get a plumber to bury him then?—*Life.*

Bridges.—"Do you suppose a man's evil deeds are written in indelible ink?" Brooks.—"I hope so." Bridges.—"Why?" Brooks.—"'Twon't last over six weeks."—*New York Herald.*

Studious boy.—"Jerry Judd asked, "Which is the safest, ice yachting or summer sailing? Is that correct?" Father—"No. He should have said, 'Which is the more dangerous?'"—*Good News.*

"I find, in looking over your bills, my son, almost all the charges are for beer and wine; scarce anything for kerosene. It seems to me that you are——" "But, dear father, a fellow can't drink kerosene."—*Fliegende Blatter.*

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: E. H. Turnock has planned a 2-story basement and attic residence, to be built at Sheffield; owner, G. W. Bayden; cost, $8,000. Wolf & Lehle have designed the buildings for a brewing plant to be erected by the Bohemian Brewing Company, at 684 to 700 Blue Island avenue; they will be of brick, stone and iron construction; cost, $100,000. W. L. B. Jenney has designed two 2-story dwellings and barns for A. C. Buttolph, to be erected on Ellis avenue near Forty-eighth street; cost, $18,000. W. W. Boyington has planned a 3-story store and flat building to be erected at 402 West Harrison street, by Miss Kate Ryan; cost, $9,000. G. Bloedner & Co. have planned a 4-story and basement store and flat building to be built at the northeast corner of Ashland avenue and Augusta street, by H. Lauber; cost, $12,000. They have also planned for Fred. C. Peterson, two 2-story and basement flat buildings to be erected at Loomis and One Hundred and Ninth streets; cost, $20,000. L. G. Hallberg has planned an elevator for the Millington White Sand Company to be built at Millington, Ill.; wood and corrugated iron construction; cost, $20-000. A. F. Wolf has planned a 4-story and cellar flat building to be erected at 1166 Milwaukee avenue, by Mrs. M. Dickinson; cost, $10,000. John Otter has planned a 3-story and basement store and flat building for M. Sternberg, to be erected on Tell court near Wells street; cost, $8,000. Burnham & Root are preparing plans for a 16-story office building to be erected on the site of the Ashland block at the corner of Randolph and Clark streets, by the Ashland Block Co.; cost, $700,000. Holabird & Roche have planned a 7-story apartment house to be erected at the corner of Fortieth street and Cottage Grove avenue; cost, $100,000. Also the Clark-Hammond 7-story apartment house to be erected at the corner of Berkley avenue and Fortieth street; cost, $100,000. They have also planned a 3-story and basement residence for P. J. Ryan, to be erected at the corner of Grand and Oakwood boulevard; cost, $15,000. Bauer & Hill have planned a 6-story and basement warehouse to be erected on the North Water near Randolph street, by Kelly, Maus & Co.; to be constructed of brick and stone; cost, $80,000. Geyer & Norton have planned a 3-story and basement flat building to be erected on State near Sixty-sixth

street, by T. P. Curley. Building will be constructed of pressed brick and stone; cost, $30,000. The same architects have planned a 2-story flat building for W. Burgheim, to be erected at 11 Hamilton avenue; to be constructed of brick and stone; cost, $8,000. J. H. Moore has planned a 2-story flat building to be erected on Warren avenue near California avenue, by H. J. Evans; to be constructed of pressed brick and stone; cost, $30,000. Also a 2-story and cellar dwelling for A. M. Hays, to be erected at the corner of Woodlawn avenue and Forty-fourth street; cost, $11,000. Treat & Foltz have planned a 4-story and basement store, flat and office building for Henry Schroeder, to be erected at Milwaukee and Chicago avenues; cost, $18,000. The same architects have planned a 3-story stable for W. E. Goudy, to be erected at the rear of his residence on Goethe street near Richie place; cost, $10,000. Ostling Bros. have planned a 4-story and basement store and flat building to be erected at 108 Oak street, by Lindskog & Freiberg; cost, $15,000. They have also planned a 3-story and basement flat building to be built at the corner of Belden avenue and Halsted street, by F. O. Lindgren; cost, $14,000.——Philadelphia, Pa.: The plans for a factory building to be erected on Broad street, north of Race, for T. J. Dunn & Co., are being executed by architect Henry D. Dagit, of No. 122 South Second street. The structure will be six stories high, with front of buff brick trimmed with light stone. J. H. Virkler will build forty-six dwelling houses at Fifty-first street and Lancaster avenue. The Atlantic Refining Company will enlarge its plant at Point Breeze. A large foundry and machine shop will be built at Twenty-third and Race streets for Berry & Orton. Charles F. Flein will erect seven small houses on the east side of Brunner street, north of Clarissa. At Second and Venango streets, S. B. McDowell will build a large storehouse. At the northwest corner of Indiana avenue and Ninth street, John Loughran, the builder, will erect a large number of dwelling houses. Two foundry buildings and a stable will be erected at the northeast corner of York and Thompson streets. A 4-story house will be built on the west side of Fourth street, south of Reed. Twelve dwellings will be erected on the north side of Herman street, west of Thirtieth, by Eldridge & Stewart. ——Detroit, Mich.: Architects Donaldson & Meier are preparing plans for the remodeling of the Cleland block on State street into an office building. Architects Mortimer L. Smith & Son have prepared plans for a church building, corner of Second and Forrest avenues, for the Third Avenue Presbyterian Society, to seat 900, and to cost $16,000. Same architects have prepared plans of a brick and stone residence, to be built on the north side of Ferry avenue for William Barkley; cost, $12,000; also plans of a double brick residence on Lincoln avenue, near Kirby; cost, $8,000; also plans of a frame summer residence on the St. Clair river, for Congressman J. R. Whiting; cost, $15,000. Architects Edward P. Van Leyen & Jean A. Hackett have prepared plans for a frame dwelling on the north side of Warren avenue near Hastings street, for Mrs. E. J. Watkins; cost, $4,800; also plans for a 3-story double brick residence on Adams avenue, for George W. Chase, of Toledo, Ohio; cost, $9,000. Architects Spier & Rohus have prepared plans of a 3-story block of stores and flats, to have cut stone trimmings, and situated on the northwest corner of Dix and Scotten avenues, for Charles Wesch; cost, $10,000. Also a block of 2-story stores and flats, corner Gratiot and Meldrum avenues, for August Knorr; cost, $10,000. Architect Gordon W. Lloyd is preparing plans for an 8-story seed warehouse on Croghan street, for the D. M. Ferry Seed Company. Also plans for several buildings to be occupied by Soda Ash Co., at Wyandotte, Mich., for J. R. Ford & Co.; cost, $30,000. Architects John Scott & Co. have prepared plans for the Protestant Orphan Asylum, to be a 3-story brick building; cost, $30,000. Architect A. E. French has completed plans of a 2-story brick residence on Commonwealth avenue, for Chas. C. Charbonneau; cost, $12,000. Architects A. C. Varney & Co. are preparing plans of a double brick residence, corner Alexandrine and Cass avenues, for R. H. Brown, Esq.; cost, $8,500. Also plans for two 3-story brick stores and flats, on Grand River avenue near Third street, for Wagner Baking Co.; cost, $11,000.——Milwaukee, Wis.: Van Ryn, Andree & Lesser have plans for a house for Fred. Stoppenbach; cost, $7,000. Leipold & Wiskocil have plans for a hotel building, the new Union House, at Port Washington, to cost about $10,000.——Pittsburg, Pa.: Architect Elmer E. Miller has plans for two houses for Mrs. Tate and one for Mrs. Little, all to be erected at Mawhinney street, Oakland. They will be built of brick and contain all latest improvements. Architect Elmer E. Miller has plans for a stone residence for William Dickson, to be erected at Sewickley. Mr. Miller has also completed the plans for a handsome stone and brick residence to be erected on Nixon street, Allegheny; it will cost about $7,000. Architect Charles Bickel has plans for a warehouse on Liberty street for Mr. L. H. Smith; the building will be eight stories with a stone front. Architect Chancey Hodgdon has plans for three brick houses for Miss E. Davidson, on Lacock street, Allegheny.——Washington, D. C.: J. F. Sanner has the contract to build a 3-story and basement dwelling for A. S. Taylor at New Hampshire avenue and Twenty-first street; architect, C. A. Harkness; cost, $8,000. Architect A. P. Clark, Jr., has plans for the dwelling and other buildings that will be erected at Herrville, near Bowie Station on the B. & P. railroad, for Austin Herr. A permit has been issued to architect T. F. Schneider to build a block of twenty dwellings on Q street, between Seventeen and Eighteenth streets, northwest, at a cost of $150,000. Architect N. T. Haller is making plans for a residence to be built for Thomas Chandler, on Thirteenth street, between H and I street, northeast; cost, $5,000.

HEATING AND LIGHTING.

Pulaski, Tenn.: The Tennessee Legislature has passed the bill under which the city asked for powers to purchase and operate an electric light or gas plant.——Port Huron, Mich.: Important improvements are to be made to the plant of the local gas company.——South Bend, Ind.: The electric company has in contemplation the erection of a new and enlarged lighting station this season in the city, provided the Council will extend the terms of the present annual contract for lighting the city for a period of ten years, or up to 1900. It is proposed to quadruple the present power of the plant, and the estimated outlay is $40,000.——Kennett Square, Pa.: An electric lighting plant is to be established. ——Pecatonica, Ill.: The Pecatonica Electric Light and Power Company is incorporated. Capital stock, $10,000. Incorporators, J. W. Wolvin, F. L. Colby and others.——Los Angeles, Cal.: The Land, Reservoir and Power Company has been formed to furnish electric lights to the people of Covina, Puente, etc.—— Ocean City, N. J.: Efforts are being made to establish a gas plant.——Marblehead, Mass.: Reports say that the local authorities will petition the Legislature for the right to operate an electric lighting plant.——Dover, Del.: A bill has been presented in the Delaware Legislature to incorporate the Dover Electric Light and Heat Company. J. Edward Addicks is interested.——Jacksonville, Ill.: At a meeting of the Council, a committee of three was appointed to select plans and estimate the cost of an electric light plant.——Duquoin, Ill.: At a regular meeting of the City Council, a franchise was granted the Henry Willis Electric Light Company to erect and maintain a plant.——Brooklyn, N. Y.: The East District Electric Light and Power Company, of Brooklyn, N. Y., has been incorporated with a capital stock of $300,000. Incorporators, T. H. Blanchle, E. S. Seeley, Theo. Dow, C. A. Smyler, H. H. Downes, S. J. Burrows and Thomas Black.—— Bridgeport, Ala.: The Bridgeport Electric Light Company has been incorporated with a capital stock of $60,000. Incorporators, A. L. Soulord, E. A. Hoffman, Jr., F. J. Kilpatrick and R. C. Gunter.

SEWERAGE NOTES.

Port Jarvis, N. Y.: It has been decided by a vote of the tax payers to establish a sewer system.——San Francisco, Cal.: Bids for furnishing pipe for the East Riverside Irrigation District have been rejected, and new bids will be called for.——Springfield, Mo.: The people at a recent election voted to establish a system of sewers.——Sioux City, Iowa.: City Engineer Wingeland can furnish particulars regarding sewer contracts, soon to be awarded. ——Carson City, Nev.: Clerk W. H. Doane writes: "Legislature has authorized the City Trustees to issue bonds in sum of $25,000 for system of sewerage. From plans and specifications prepared last year, the proposed system will require about 25,000 feet 6-inch vitrified pipe, and about 5,000 8 and 10 inch, and I think about five flushing tanks.——Whatcom, Wash.: It is proposed to bond this city for $200,000, in order to put in a sewer system and make othe

improvements.——Los Angeles, Cal.: Engineer Dockweiler will begin at once a survey for an outfall sewer to the sea.——Chattanooga, Tenn.: Plans will be prepared in a few days for a number of proposed new sewers. The plans will be submitted to the inspection and approval of the Board as soon as the balance of the sewer funds are available. Specifications will be made out and the contracts let. The ordinance for the issuance of the $75,000 sewer bonds is still in the hands of the Finance Committee and the City Attorney, to whom it was referred at the last meeting of the City Council.——Alliance, Ohio.: A vote will soon be taken on the establishment of a sewer system.——Sheboygan, Wis.: Address the City Clerk regarding proposals for a sewerage system.——South Bend, Ind.: Address City Clerk Hunt regarding proposals for sewer.——Highland Park, Ill.: Address J. Finney regarding proposals for sewer pipe.

WATER WORKS NOTES.

Portsmouth, N. H.: The water bill has become a law.——Waltham, Mass.: An expenditure of $20,000 for water works extension has been ordered.——Collinswood, N. J.: The Collinswood, N. J., Water & Light Co., has been incorporated with a capital of $25,000.——Blair, Neb.: On April 7th a vote was taken on the question of bonding the town for water works extensions.——Canton, S. D.: The Pierre, S. D., Water Works Co., will shortly commence to put in for the city of Canton, S. D., a stand pipe system of water works.——Springfield, Ohio.: The water works trustees have recommended the issuance of $25,000 of bonds to defray the cost of extensions of mains.——Holland, Mich.: The city expects to spend about $17,000 for mains and hydrants.——Lorraine, Wyo.: The citizens have petitioned the council to submit to the people at the next election the question of issuing $100,000 of bonds for a new supply.——Ballard, Wash.: The town is contemplating putting in its own water works and the officials are inviting bids.——Dayton, Wash.: The city will receive bids until the first day of May, 1891, for $75,000 worth of "Dayton Water Works Bonds," to be dated and issued May 1, 1891, papable twenty years after their issue bearing interest at the rate of six per cent. per annum, and having attached thereto semi-annual interest coupons, payable at this city or at Dayton. Denominations not less than $100, nor more than $1,000.——Beardstown, Ill.: Proposals are wanted for the construction of a system of water works.——Sparta, Mich.: Water works will probably be put in this summer.——Marshville, Wis.: It is reported that water works will be constructed soon.——Kent, Wash.: A movement is on foot to construct water works.——Duluth, Minn.: Address City Engineer Fuller for particulars regarding water works.——Evergreen, Ala.: Steps will soon be taken looking towards the construction of water works.——Medford, Ore.: The Rogue River Valley Water Company has been formed with $125,000 capital stock, H. Klippel can give details.——Crockell, Tex.: A system of water works will probably be constructed this summer.

BIDS AND CONTRACTS.

St. Paul, Minn.: Proposals are wanted until April 16, for the erection of certain public buildings at Camp Sheridan, Wyo. Address John V. Furey, Quartermaster, U. S. A., Chief Quartermaster.——Beardstown, Ill.: Proposals are wanted, for the construction of a system of water-works. Address Mayor H. M. Schmoldt.——Newport, Ky.: Sealed proposals, in triplicate, subject to usual conditions, will be received until 11 o'clock A. M., April 23d, 1891, and then opened, for construction, at Fort Thomas, Kentucky, of the following described buildings of brick and stone, and for the plumbing and gas piping for same, viz.: Two (2) single sets officers' quarters, two (2) double sets officers' quarters. The bids to be separated, as follows: 1st, building, complete, except plumbing and gas piping; 2d, plumbing and gas piping. Plans, specifications, blank proposals and full instructions to bidders will be furnished on application to this office. Envelopes containing proposals should be marked. "Proposals for Construction of Public Buildings," and addressed to First Lieutenant R. B. Turner, 6th Infantry, A. A., Q. M. U. S. A.——Columbus, O.: Proposals are wanted until April 20 for the construction of a viaduct over the railroad tracks at Leonard avenue. Address Frank J. Reinhard, County Auditor.——Newton, Mass.: Proposals are wanted for the construction of 17¾ miles of sewers. The approximate quantities of material wanted are: 1,500,000 hard burnt brick, 600 cast-iron manhole covers, 5,000 barrels American cement, 250 barrels of Portland cement. Address City Engineer A. F. Noyes.——Monmouth, Ill.: Sealed bids are wanted until the 18th day of April, 1891, for the boring or drilling of a deep well, 12 inches in diameter for the first 150 feet, and 8 inches in diameter for about 1,075 feet. Also sealed bids for a high duty pump with a capacity of 750,000 gallons per 24 hours. The Council reserves the right to reject any and all bids. Address M. G. Browning.——Cincinnati, O.: Proposals are wanted until April 25, for the construction of a wrought-iron truss bridge, abutments and wing walls. Address the County Commissioners.——Hinsdale, Ill.: Proposals are wanted until April 13, for the construction of a system of water-works. Address Henry A. Gardner, Chairman of the Fire and Water Committee.——Noblesville, Ind.: Proposals are wanted until April 22, for the construction of a system of water-works. Address J. W. Smith, Mayor.——Aberdeen, Wash.: Plans and specifications for a system of water-works are wanted here until April 15. Address J. H. White, City Clerk.——Waterville, Me.: Proposals are wanted until April 15, for the erection of a brick building on the grounds of the Maine State College at Orono. Address William T. Haines, Secretary of the Trustees.——New Hampton, Iowa: Proposals are wanted for the construction of a system of water-works. Address the Town Recorder.

Miracles and Medicine is the fruitful subject which Dr. Andrew D. White will take up next in his Warfare of Science papers in The Popular Science Monthly. The May number will contain the first part of this chapter, telling how tales of miraculous cures arose and grew in the middle ages, and how the early progress of medical science was hampered by the jealousy of relic-peddlers and theological oracles.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue, Chicago, Ill.

CHICAGO, MILWAUKEE & ST. PAUL RY.

Electric Lighted and Steam Heated Vestibuled Trains, with Westinghouse Air Signals, between Chicago, St. Paul and Minneapolis, daily.

Through Parlor Cars on day trains between Cnicago, St. Paul and Minneapolis.

Electric Lighted and Steam Heated Vestibuled Trains between Chicago, Council Bluffs and Omaha, daily.

Through Vestibuled Sleeping Cars, daily, between Chicago, Butte, Tacoma, Seattle, and Portland, Ore.

Solid Trains between Chicago and principal points in Northern Wisconsin and the Peninsula of Michigan.

Daily Trains between St. Paul, Minneapolis and Kansas City via the Hedrick Route.

Through Sleeping Cars, daily, between St. Louis, St. Paul and Minneapolis.

The finest Dining Cars in the World.

The best Sleeping Cars. Electric Reading Lamps in Berths.

6,100 miles of road in Illinois, Wisconsin, Northern Michigan, Iowa, Minnesota, Missouri, South Dakota and North Dakota.

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Durham . System . of . House . Drainage.

Silver Medal Awarded in 1883 to the Durham House Drainage Company, of Chicago.

E. BAGGOT, Chicago.

OFFICE & SALESROOMS: 169 & 171 Adams Street,
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P. V. Dwyer & Bro., St. Paul.

Durham Sanitary Engineering and Construction Co., Minneapolis, Minn.

Hussey & Day Co., Omaha, Neb.
Henry Paul, Houghton, Mich.
J. D. Madden, Fort Wayne, Ind.
J. M. Toye, Winona, Minn.

Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E AND **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F AND **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

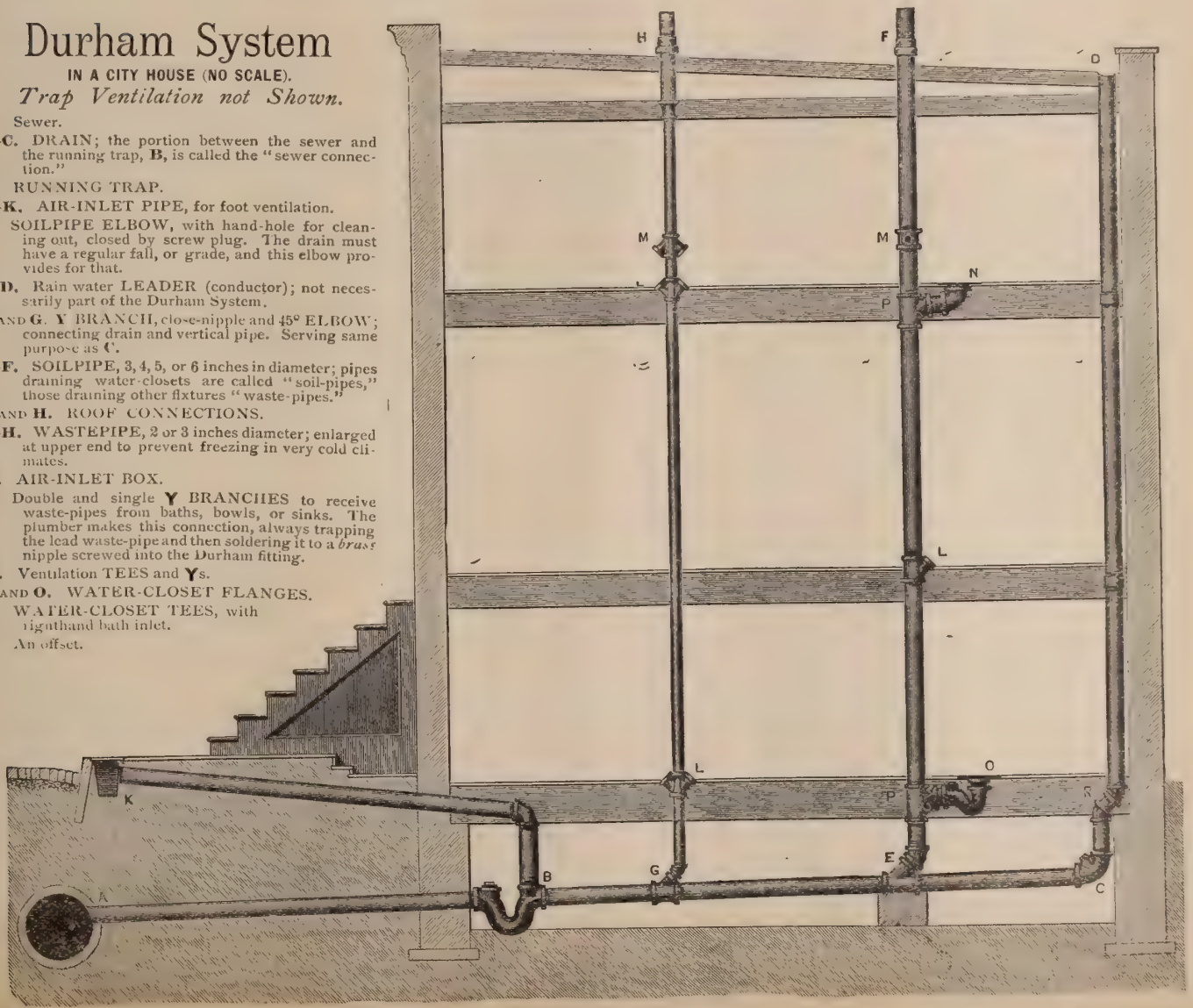
L. Double and single **Y** BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and **Y**s.

N AND **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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Boyle's Patent Valve Basin

Is the cleanest and most attractive Wash Basin made

Thousands of Them in Use.

Please call at our showrooms,

82 Dearborn Street, Chicago.

And examine our line of SANITARY SPECIALTIES set up with water attached.

HENRY HUBER & CO.

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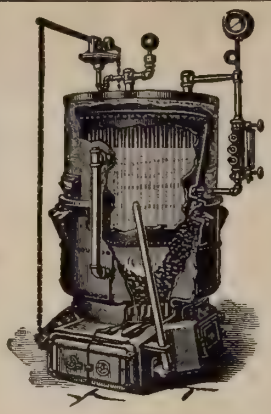

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"Perfection in Modern House Heating."

Automatic, Self-Feeding, Wrought-Iron, Tubular, and Sectional.

The position of the coal pockets is such that the reservoir can be as easily filled as an ordinary kitchen range. Hundreds in use, giving entire satisfaction. Our new book on Modern House-Heating, furnished on application.

IT BURNS THE SMOKE! THE GORTON SOFT-COAL BOILER.

GORTON & LIDGERWOOD CO.,

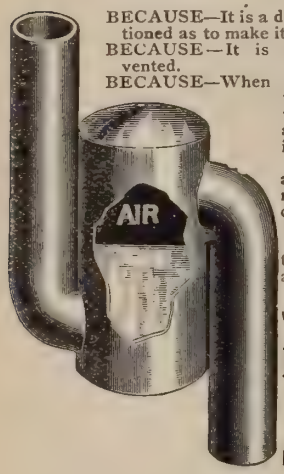
34 and 36 West Monroe St., Chicago.

96 Liberty St., NEW YORK. 197-203 Congress St., BOSTON.

THE CLEAN SWEEP

Non-Syphon Sewer Gas Trap

IS THE BEST AND CHEAPEST.



BECAUSE—It is a drum trap, so proportioned as to make it self-cleaning.
BECAUSE—It is non-syphoning, unvented.
BECAUSE—When vented the vent is taken out above the water level making it almost impossible for it to get stopped up.
BECAUSE—It has a large trap screw, making it easily accessible.

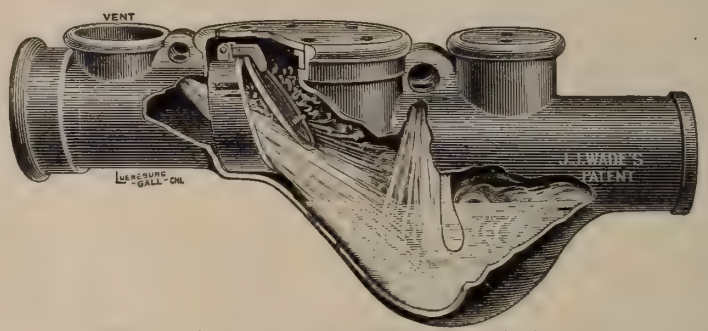
We are giving the trade a scientific trap at a low price.

If you use it once you will use it always.

Detroit Sanitary Supply Co.,

37 FIRST STREET,

Detroit Mich.



Main Trap in Cellar, showing Flushing Device in Operation.

THE WADE PATENT FLUSHING FITTINGS

Are made of extra heavy Iron, and are capable of resisting 250 lbs. pressure. The Cover is perfectly tight, being screwed against gasket, but may be easily removed.

The particular advantages derived from the use of these fittings are that the owner may at any time inspect the condition of his sewers; when flushing becomes necessary a hose can be attached, and the cleansing performed in this easy manner, or they may be connected direct with the Main Water Supply. They are made to be used with either Clay or Iron Pipes.

The Fittingsare so constructed that a Back-Water Gate may be attached, thus preventing the flooding of Cellar. They are an infallible protection against Sewer Gas.

HENRY STEPHEN,

WESTERN SALES AGENT

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W. AUSTIN OBDYKE & CO., sole manufacturers of The Austin's Corrugated Expanding Conductor, Spiral Ribbed Pipe, Adjustable Elbows and Fastenings.

THE SELF-CLEANING BOILER AND TANK CO., only Sanitary Circulating Boiler manufactured.

SIMS & MILLARD, manufacturers of the Sims Patent Eave Trough, Mitres, Fasteners, Roof Gutters and Ridge Rolls.

A. G. STILSON, manufacturer of The Stilson "Gem" Stovepipe Thimble and Favorite Adjustable Kettle Cover.

CLARENCE M. KEMP, sole manufacturer of Climax Specialties:

GAS MIXER,
GAS MACHINE,
DRILL CHUCK,
CELLAR DRAINER,
SOIL PIPE PLUG,
SEVEN POUND PIPE VISE,
OPEN FRAME " "
O. F. RAPID MOVING PIPE CUTTER,
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COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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Chicago has been honored by the appointment W. J. Edbrooke as Supervising Architect of the Treasury. In the appointment this city has been complimented and the country well served. The appointment was made not only in recognition of Mr. Edbrooke's ability and reputation as an architect, but in consideration of his executive capacity and general fitness to discharge the duties of that office. As an architect he is representative, able, and has achieved that eminence which has won public confidence and will secure him the congratulations and well wishes of the profession. As a public officer he has the qualifications and force which fit him for the position to which he has been called which is largely executive. Mr. Edbrooke will accept the office at a sacrifice financially but we feel that his public services in this capacity will bring him the reward merited by a faithful, upright, and able discharge of the duties and responsibilities he has assumed.

As soon as talk began regarding the World's Fair men began talking about building; some wanted to build high, some broad, and some deep. Now let some one talk about building well. A house perfectly constructed, in regard to every portion of it, with the best plumbing, the best heating and ventilation and everything approved by the best modern thought, would be an exhibition that would be worth more than any tower, mine shaft, or acres of canopy.

The sanitary needs of a city are always constant, and care and watchfulness are continually needed to preserve the proper health conditions; but special care will be required in Chicago from this time on till after the World's Fair. The increase in building will demand more inspectors, and the increased demand for more of everything will put to the test the capacities of every office in the city. The exposition at Paris polluted the water, deposited extra filth, and increased sickness and the death rate. These things should be anticipated and provided for in due time.

A great deal can be learned by discussion. Any feature of plumbing in this age of progress is a fit subject to discuss, and our columns are always open.

The day is fast passing for the jerry builder. He will soon be without an occupation, and it is well. City ordinances are being enacted for the protection of the people; and the importance of safe and healthful buildings is becoming so fully recognized that Mr. Jerry must step aside and let more honest and capable men take his place. The National Association of Building Inspectors is another strong bar set up against the malconstruction of the cheap Johns who endanger life and demoralize building interests. Plumbing inspection and the enforcement of plumbing ordinances with their rules and regulations are proving a most substantial check on this portion of dangerous building construction, and the energy and intelligence with which this branch of building is being elevated and perfected is a commendation of the efforts of plumbers more eloquent than any words of praise that could be given. The jerry plumber is a necessary accompaniment of the jerry builder, and when the master plumbers step in and say there shall be no more dangerous and disreputable plumbing work done, the jerry builder is left with his longest leg sawed off and will stand very shaky if he stand at all. We trust he will fall and fall hard, and that the ruin of his fall will be as complete as the wreck of his collapsed buildings.

SANITARY EXHIBITS AT THE WORLD FAIR.

As important as sanitary science is, so important is everything that tends to promote it and render its offices effective and efficient. The province of sanitation, while not difficult of definition and boundary, it fails to receive the recognition and appreciation due it because its purposes and results are not clearly tangible or immediately observable. In its operations it is in a sense negative, as its office is to prevent that which would have happened had no preventive measures been employed. It is difficult for one to comprehend the existence of something that has been prevented from existing, that is where there is health, where no sickness exists, we do not conceive of any cause for this state of affairs, or concern ourselves with the conditions which conduce to health. On the other hand when sickness prevails,

when the conditions of health have been violated, we are made conscious of visible results of some existing cause. When one is sick, a cure is something that is immediately discernable, a result of something done; but health is too often looked upon as naturally existing and not the result of any act or the effect of conditions necessary to health. This results from the fact that one is not appreciative of health until it is impaired, and will secure the cure of disease while thoughtless in regard to preventing it. We define darkness as being the absence of light, cold as being the absence of heat; why then not sickness as being the absence of health. We prevent darkness by securing conditions necessary for light; we prevent coldness by maintaining the conditions necessary for warmth. Why then may we not prevent sickness by securing the conditions necessary for health and as fully comprehend the philosophy and importance of it?

Because the public are not well educated or informed with regard to the importance of this science, is one of the strongest reasons why advantage of every opportunity should be taken to promote education in this regard and to advance the science on which rests man's greatest material welfare. The literature on this subject is fast assuming a prominent and respectable place in that of the country, and research and invention, the study, the laboratory, and workshop are bringing into it the fruits of their labors. A display of all these at the coming World's Fair would serve not only as an educational force, but would open up to enlightened minds the importance, the creditableness and respectability of this science whose progress in the last decade has been as remarkable as the advancement of learning has ever disclosed. In interest and utility it ranks with any department that will be represented, and in importance it holds the first place in the catalogue of exhibits.

There could be no better opportunity offered for an exhibition of the agencies that have been silently working in promoting and conserving the energies and physical and mental forces which have developed this great country, and made possible this vast collection of the world's resources and products of its mighty energies and industry. The construction of a modern sanitary home would in itself be a lesson that would leave a good and lasting impression on the minds of the multitude who will gather at this great exhibition. But this would form a small part of the interests to be represented. Sanitary science reaches out and touches everything that is immediately or remotely connected with the well being of the human race. It has made possible the construction and population of our great cities—the collected energies and industry whose forces encircle the world. Take away from our cities all that sanitary science has supplied, and a greater calamity would befall them than the plague that visited Athens when, to appease the wrath of the offended deities, the altar was erected to the Unknown God. It is surely important and necessary that the agencies which are so great a part of human industry, activity and progress should be represented among the products of the world's endeavors—the proud offsprings of nature's forces and human industry.

There will be represented the arts, sciences and industries, the products of the field and mine, the workshops and factories, and all things that go to make up this great world in this great age. Is it not proper that, along with these, there be represented that science which has performed so great a part in their creation by contributing to the vigor and health that have produced them? While exhibiting the products of the world let us exhibit that which has contributed so largely to the forces that have made their production possible. While we exhibit the wealth of the country let us exhibit that which forms so great a factor in its production. There will be displayed the pomp and grandeur of armies and navies with the best and latest inventions for the destruction of lives. Alongside of these would it not be meet to exhibit the best and latest appliances for the preservation of lives and the promotion of health?

THE LOWEST BIDDER.

Where bids are invited on plumbing work and there is considerable range between the hightest and lowest bid, one thing is always noticeable regarding the comments made, and that is the inordinate greed of the highest bidder, who he is at once set down as a "thief and robber," The most important feature of a great deal of this lowest-bidder business does not seem to present itself to the minds of those who are happiest when saying the worst things possible about the highest bidders. It does not seem to occur to them that the most of these remarkably low bids should be looked upon with a reasonable degree of suspicion. It is not to be presumed that anyone bids on a job for fun. It requires time and labor to formulate a bid on plumbing work, and it is not often indulged in for recreation. Those who bid do so for the purpose of performing the work, and no one goes to work intentionally to bid himself out of a job. He has an easier way than that to get out of it, and that is not to bid at all; so, if he bid he will do so with a probability of securing the contract. It is not to be supposed that the highest bidder puts in an estimate that will be beaten by a lower bidder with the intention of it being so done. He wants the job or he would not bid at all, and he makes an estimate on the kind of work he proposes to put in and bids correspondingly. So all the bids are made, and the lowest bidder figures on the kind of material and workmanship, he proposes to furnish, but it is not at all the same as that bid on by the highest bidders. He figures on poor material and poor workmanship and these are just what he will furnish. He is the "thief and robber," for poor plumbing work is worse than none, and money put into it is thrown away. The difference is in the quality of work furnished and not in the consciences of the bidders. The lowest bidder often makes a bigger profit on the work he does, than the highest bidder makes on the kind of work he performs. We are speaking, of course, of the remarkably low bidder.

Our attention has often been called to bids of this character which, any one at all acquainted with plumbing work, would know could not cover the cost of passable material or skill. At such prices it is absolutely impossible to supply acceptable material and furnish ordinary skill in workmanship. There is a pretty well defined fixed price for everything, and when a price falls many degrees below this we are very apt to look upon it with suspicion, and prefer to pay more for better quality as a means of saving money. There are some things we may safely purchase at a low price knowing we will receive a poor quality, but plumbing is not of that class. We cannot afford to have the bad or the indifferent; we can afford only the best. While poor plumbing is dear at any price, good plumbing is cheap at any reasonable figure, and we do not remember having seen any bill entirely out of reason. The highest bid does not mean the biggest profit by any means. It does mean better material and higher priced skilled labor and healthier and more secure and comfortable homes.

There may be instances wherein business rivalry is so sharp that this will induce a cut in prices prompted by a considerable degree of spite; but it should be remembered that men are not given to pay too much for spite work or go too deep in their pockets to underbid a rival. If there is that in such a bidder that will lead him to such practices, there is also that in him which will find some way out of the job without a serious shrinkage of his bank account or the loss of much labor or time. The owner of the building is the one who generally pays for this kind of cut in prices, and the successful bidder vents his spleen at the expense of the owner. This does not apply to all bids on contract work but to such bids whose remarkable lowness gives room for doubt as to the honesty of the material and work furnished.

NOTES AND NEWS.

Seaweed is now made into a tough paper, which takes the place of window glass. When colored the effect is similar to stained or painted glass.

A drainage scheme proposed for Melbourne by the government engineer is estimated to cost $25,000,000.

An artistic effort has been produced by India rubber panels or veneers, which are very beautiful in color and admit of easy cleaning with soap and water.

Dr. John Ege, of Reading, Pa., who has of late been experimenting with skin grafting between white and black persons, has found that the transferred skin does not maintain its original color, but gradually assumes that of the man of whom it has become part and parcel.

Mr. J. Bull, the inventor of Bull's metal, has recently devised a method of refining copper by a Bessemer process, and, though

working on but a small scale, has succeeded in obtaining very satisfactory results.

The most novel of the late telephone inventions has a glass diaphragm resting on glass rods, and communicating with the ordinary wire. It is claimed that a whispered conversation has been carried on intelligently over a distance of three miles on the trial instrument.

More than 300 different industries, says the *Southern Lumberman*, enter into the building of every ocean steamship. To build a 2,500 ton steamship requires 600 men in direct and constant employment, averaging $500 per man. The sum of $300,000 is thus distributed to the trades.

Statistics of longevity just published by the German government, show that in 1888 there were ninety-one persons in Prussia who were over a hundred years old, and between 1864 and 1888 upwards of seven thousand persons of over a hundred died, and of these one hundred and fifty-five were more than one hundred and nine.

Orders have been given the Prussian Army Surgeons to measure the chests of recruits every four weeks. All are to be regarded as narrow-chested the circumference of whose chests is less than half the length of the body. Narrow-chested men, whose bodies are not widened by drill, are to be regarded as predisposed to consumption and to be discharged as soon as possible, lest they infect healthy soldiers.

The committee on Public Health of the Massachusetts Legislature recently passed a resolution that the State Board of Health should undertake an investigation into the dangers to human life and health arising from tuberculosis in the food products of cattle. It was recommended that authority be given to spend a sum not exceeding 15,000 dollars on the inquiry.

An ingenious device for measuring distances, and which will be likely to interest architects and builders, is an invention of an English firm. It consists of a small revolving wheel which operates a spindle, the revolutions being accurately registered by a dial counter. By running the distance wheel along a wall or other surface the recorder will show how many feet have been measured. There is practically no limit to the distance that may be determined by this little device.

An eminent German bacteriologist has recently been studying the impurities found under the finger nails, and has discovered abundant evidence to support the popular idea that there is something particularly poisonous about the scratch of the nail. In seventy-eight examinations made by the authority referred to, more than fifty different kinds of germs, besides various sorts of mold spores, were found present. These experiments emphasize the necessity of frequently and carefully cleaning the finger nails.

Dr. Dowd, of New York, has been making a careful study of the number of germs found in the soil, which is known to be everywhere swarming with these minute organisms. The number of germs present in a cubic inch of soil was found to vary from sixty thousand to two and one quarter million.

Observations made in Buenos Ayres, where diphtheria has been very prevalent, go further to show the intercommunicability of this disease between man and animals. Most of the houses in that city have open spaces within, known as *patios*. These are not paved, and among the poorer classes horses and hens are kept in them. The soil is retentive and always damp, and hens living in these places are subject to a throat disease which is without doubt diphtheria. From the statistics given, there seems to be no doubt that children in large numbers contract the disease from these animals. It is well known too that in the French army diphtheria is three times as prevalent in the cavalry regiments as in the infantry. The same holds true in Germany and in other countries.

NATIONAL BOARD OF HEALTH.

The following is abstracted from a paper read by Prof. A. Arnold Clark, Lansing, Mich., on "The Commonwealth and the Common Health":

While nearly every second-rate power in Europe has its National Board of Health, ours has none. In 1887, Congress appropriated $500,000 for the investigation of tuberculosis in cattle and of hog cholera—more than it has ever appropriated for the prevention of diseases in man. New York State appropriated $105,000 more, Virginia $75,000, and yet from the mere financial standpoint all the cattle and hogs in the United States are not worth so much as the lives sacrificed each year to the diseases which we know how to prevent.

Four years ago Edwin Chadwick, commenting on an appropriation of the Spanish Legislature for equipping war vessels, showed that the same amount of money expended in sanitary improvements would, in ten years, save over two hundred thousand lives and prevent two million cases of sickness. Such an appropriation would be hooted, and yet Spain lost more lives during the last cholera epidemic than during the great Peninsular war. In the Crimean war 20,000 French soldiers died in battle; 75,000 died of disease. Of our Michigan boys who enlisted in the Union army during the late war, disease carried off four times as many as the fields of battle and the wounds of battle. And yet a nation which pays thousands of dollars to maintain a large standing army to protect us against those foreign foes with whom we ought to be at peace, a nation that spends thousands of dollars to study the diseases of peaches and pears, thousands of dollars to protect its fish and the young seals of Alaska, has done practically nothing for the prevention of diseases in man.

PHILADELPHIA MASTER PLUMBERS' ASSOCIATION.

The Master Plumbers' Association, of Philadelphia, was chartered in January, 1885, and included in our Constitution was a clause stating that the object was to promote fraternity among its members, maintain social enjoyment, establish and support a plumbers' trade school, and, by the influence of honorable principles, to elevate the plumbing business. These objects have always been our guiding-star, shining forth in all kinds of weather, enabling us to keep in the right path and placing us on a solid and permanent foundation.

The first object that claimed our attention was the establishment of a trade school to be conducted in the interest of the apprentices of the members of the association. Each member was privileged to send his apprentices, the fee being $3 for the term, lasting about three or four months. We had a great deal of prejudice to contend with, and, consequently, it was up hill work; but we can say we were the first association to establish a trade school, and we have now turned over to the Master Builders' Exchange our trade school, which is conducted in conjunction with a school operated by the Exchange, embracing all the several branches of the arts connected with the erection of buildings.

The following is a brief abstract of the school up to the time of connecting with the Master Builders' Exchange. The school started on February 5, 1884: The spring of 1884 was attended by 46 pupils; the term 1884 and 1885, by 34; 1885 and 1886, by 31; 1886 and 1887, by 27; 1887 and 1888, by 41; 1888 and 1889, by 61.

During the terms the pupils received instruction two evenings a week, one night devoted to shop practice and the other night to lectures, drawings, and answering practical questions; each pupil was marked according to his proficiency, and his average given him at the end of the term. Those receiving the highest average were given certificates. There were also reports made out during the terms and sent to the employers of the pupil, that he might become acquainted with the progress of his apprentice.

The labors of the association, while of a very arduous nature, certainly brought us considerable encouragement by interesting others by bringing into the field schools of other mechanical persuits. Considerable expense was attached to carrying on the school, but by the aid of kind and sympathetic friends who assisted us with funds and material, together with the small fee charged each pupil, we managed to come out free from debt at the close of each term. We are still contributing to the support of the school.

During the progress of the school we were hard at work on other matters; one in particular was an ordinance passed by the Legislature compelling the inspection of plumbing work inside of buildings. This was approved and passed by the Legislature on June 30, 1885. This was the turning point in the art of plumbing in Philadelphia. Work that was at one time considered first-class was condemned and good reasons shown for so doing. At the present time no expense is spared to have the highest class of

work done, and people ask for it; they begin to realize that sanitary plumbing is just as essential to good health as good food is to sustain life, and that an expert plumber is as necessary as an expert doctor.

The rules and regulations governing plumbing and drainage in our city follow. In regard to the testing of soil pipes our association was the first to adopt the air test of three pounds to the square inch. It was shown that air is more searching than water, and pipes that would stand a twenty-five pound water test would leak if subjected to a three pound air pressure. Many of us have bought tested pipe which was put to a hydraulic test of twenty-five pounds and would not stand the air test; therefore while air is the most searching it is certainly the best test when we are endeavoring to exclude sewer gas from our premises, and it will no dout in time become the universal test throughout the country.

Our association is in a good healthy condition, although our membership is not very large for a city of the size of Philadelphia, which contains about 600 or 700 plumbers; but it will no doubt increase in size as time progresses.

JOHN E. EYANSON.

Our President, John E. Eyanson, is a native of Pennsylvania; his ancestors for several generations were natives of this and the state of Maryland. John E. Eyanson, his grandfather, served seven years as a soldier in the war of Independence. John E. Eyanson was born on Commerce street, Philadelphia, in the year 1834, his education being completed in the public grammar school at the age of fourteen years. At this time he commenced work as a store and office boy. About 1850 he entered as an apprentice with his uncle John Philbin, of New York, who had bought out the plumbing establishment of Mr. Robert Looney at 11 South Seventh street. After having served five years, including a few months in which he worked under instruction with Messrs. Philbin & Quinn at Fourth and Broadway, N. Y., he entered into an agreement to work journey work with E. Hubball & Bro., 12 Liberty street, and Thos. C. Bashor & Co., Light street, Baltimore, where he remained almost continuously excepting a year or so. He traveled in the West and South and conducted business for himself. At the death of his Uncle Philbin in 1868, he returned to Philadelphia and bought out the old stand in partnership with his cousin S. K. Philbin, who, at the expiration of a few years, retired from business, selling out his interest to his partner who conducted it alone until January 1, 1888, when he associated his son J. Edward with him.

Mr. Eyanson is now serving his third term as President of the Master Plumbers' Association of Philadelphia. He was one of the organizers of the Philadelphia Plumbing Trade School, the first in this country under the auspices of the Master Plumbers. He is also one of the Board of Directors of the Master Builders' Exchange of our city.

OFFICERS.

President, John E. Eyanson; Vice-presidents, A. M. Hicks, J. Sellers Kite, Chas. L. Parmalee, A. G. Bond, Geo. F. Uber; Recording Secretary, Enoch Remick; Corresponding Secretary, Wm. S. Clark; Treasurer, William Harkness, Jr.

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Arbitration.—Samuel W. Norris, J. D. Thomson, F. P. Brown, Jos. Gusenberger, J. B. Reynolds.

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Apprenticeship.—Daniel B. Cobb, James Webster, Saml. B. Fleming.

Registration.—John J. Weaver, Enoch Remick, Wm. Harkness.

Conference.—Wm. H. Doyle, Wm. McCoach, Wm. Calhoun.

Trade School.—Wm. Harkness, John J. Weaver, Enoch Remick.

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CHARTER.

Be it Known, That we, whose names are hereunto subscribed, and our associates, citizens of the Commonwealth of Pennsylvania, residing in the city of Philadelphia, have associated ourselves together, and formed and organized a society or association for such enjoyment, and do declare that we and our associates, with such persons as may from time to time become members, and our and their successors, are desirous of acquiring and enjoying the powers, immunities, and privileges of a corporation or body politic in law, and in fact, the name, style, title, objects, articles, and conditions whereof are fully set forth in the Constitution,

Subscribers.

John J. Weaver, No. 1238 Spring Garden street.
Wm. M. Wright, No. 1419 Arch street.
Albert M. Hicks, No. 717 North Seventh street.
A. G. Bond, No. 1326 Fairmount avenue.
Wm. Harkness, Jr., No. 1537 South Ninth street.
Wm. W. Mentzinger, No. 709 Locust street.
Enoch Remick, No. 924 North Second street.
Geo. T. Gabell, Jr., No. 723 Shirley street.
John E. Eyanson, No. 207 South Tenth street.
Geo. F. Uber, No. 664 Bankson street.

Commonwealth of Pennsylvania, city of Philadelphia, *ss.*

On the tewenty-third day of December, A. D. 1884, before me,

John O'Donnel, Recorder of Deeds, in and for the city and county of Philadelphia, personally appeared before John J. Weaver, William M. Wright, and Albert M. Hicks, three of the persons whose names are subscribed, and who executed the above Articles of Incorporation, and severally acknowledged the same to be their respective act and deed, and desired that the same might be recorded as such. In witness whereof, I have hereunto set my hand and caused the seal of my office to be affixed the day and year aforesaid. Signed,

[SEAL] JOS. K. FLETCHER,
Deputy Recorder of Deeds.

Dec., 1884. } Filed Dec. 31, 1884.
C. P. No. 1. } TURNBULL, *Pro. Proth'y.*

Decree.

City of Philadelphia, *ss.*

I, William S. Peirce, Judge of the Court of Common Pleas, No. 1, for the city and county of Philadelphia, do certify, that on the twenty-fourth day of January, one thousand eight hundred and eighty-five, the above Charter and acknowledgment thereof, duly certified under the official seal of the Recorder of Deeds of said county, was presented to me, accompanied by proof of publication of notice in two newspapers of general publication and circulation of said city, for three weeks, setting forth briefly the character and object of the corporation to be formed, and the intention to make application for said Charter, as required by the Act of Assembly of the Commonwealth of Pennsylvania, approved April 29, 1874, entitled, An act to provide for the incorporation and regulation of certain corporations and supplements thereto; that I have perused and examined said instruments and have found the same to be in proper form, and within the purposes named in the first class, specified in the second section of said act; that the objects, articles and conditions thereof appear lawful and not injurious to the community. And I do hereby, on motion of Edward H. Cloud, Esq., on motion of the petitioners, order and decree that the said Charter of the "Master Plumbers' Association of the City of Philadelphia" be and the same is hereby approved, and that upon recording of said Charter and this order, the subscribers thereto and their associates shall be a corporation for the purposes and upon the terms therein stated.

(Signed) WILLIAM S. PEIRCE, [SEAL]

Recorded in the office of the Recorder of Deeds in and for the city and county of Philadelphia in Charter No. 10, page 61. Witness my hand and seal of office this twenty-seventh day of January, A. D. 1885.

(Signed) JOS. K. KLETCHER, [SEAL]
Deputy Recorder of Deeds.

AN ACT REGULATING HOUSE DRAINAGE.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That from and after the passage of this act the boards of health in cities of the first class shall be and they are hereby authorized and directed to adopt and promulgate suitable rules and regulations for the construction of house drainage and cesspools, and to provide for the registration of master plumbers and persons engaged in the plumbing business in said cities: *Provided, That no cesspool shall be permitted to drain into a sewer. And provided further, That nothing in this act shall be construed to apply to cesspools in existence at the present time or their connection with or drainage into any sewer.*

SEC. 2. They shall also establish a system of inspection and supervision over all house drainage and cesspools and ventilation of the same, and appoint such inspectors as in their judgment may be necessary, at such compensation as may be approved by the councils of said cities.

SEC. 3. Any person who shall refuse or neglect to comply with the requirements of said rules and regulations when promulgated shall be guilty of a misdemeanor, and, on conviction, be sentenced to pay a fine of not more than one hundred ($100) dollars, or undergo an imprisonment not exceeding one year, or both in the discretion of the court.

Approved the thirtieth day of June, A. D. 1885.

ROBT. E. PATTISON.

SANITARY OFFICERS.

Committee on House Draining and Plumbing of the Board of Health.—Marcus A. Davis, P. D. Keyser, M. D.

Chief Inspector of House Drainage, etc.—Geo. S. Hughes, 1431 Park avenue.

Inspectors of House Drainage, etc.—James Mellen, 419 N. Sixty-third street; Lawrence Shuster, 402 Franklin street; John S. Bross, 1619 Gratz street; John Calhoun, 2230 Catharine street; Augustine H. Brown, 1010 Sansom street; Saunders L. Marcer, 2114 W. Norris street; George Shegog, Jr., 1520 Frankford avenue; J. R. Hamilton, Rochelle avenue, Wissahickon; J. H. Mactague, 1150 S. Sixth street; M. C. Cline, 865 Bambrey street.

Clerk of House Drainage, etc.—James W. Nutt, 2242 Oxford street.

1. John Calhoun, S. from S. S. of South street, from river to river.

2. L. Shuster, N. from N. S. of South street to S. S. of Montgomery avenue, from E. S. of Broad to W. S. of front.

3. A. H. Brown, N. from N. S. of South street, to S. S. of Poplar street, from W. S. of Broad street, to Schuylkill river.

4. J. H. Mactague, N. from N. S. of Poplar street to S. S. of Montgomery avenue, from W. S. of Broad street to Schuylkill river and the 24th Ward.

5. M. C. Cline, N. from N. S. of Montgomery avenue to City Line, from E. S. of Broad street to W. S. of Front street.

6. J. S. Bross, N. from N. S. of Montgomery avenue to S. S. of Lehigh avenue, from W. S. of Broad street to Schuylkill river.

7. J. K. Hamilton, N. from N. S. of Lehigh avenue to City Line, from W. S. of Broad street to City Line.

8. George Shegog, N. from N. S. of Poplar street to City Line, E. from E. S. of Front street to Delaware river.

9. S. L. Marcer, 27 and 34th Wards.

RULES AND REGULATIONS

For the Registration of Master Plumbers, and persons engaged in the plumbing business, and relating to plans and specifications for house drainage and the ventilation thereof, in the City of Philadelphia, under the powers vested in the Board of Health, by the Act of Assembly, June 30, 1885.

1. On or before April 1, 1886, every person engaged, or about to engage, in the plumbing business in the City of Philadelphia as a Master Plumber, or any person coming from other places for the purpose of doing plumbing work in the City of Philadelphia as a Master Plumber, shall appear in person at the office of the Board of Health and register his name and address upon forms, prescribed by the Board of Health, and receive a certificate of registry; and no person other than a registered plumber shall be allowed to carry on or engaged in the plumbing business, or make any connection with any sewer, drain, soil, or waste pipe, or any pipe connected therewith.

2. It shall be the duty of every registered plumber to give immediate notice of any change in his place of business, for the correction of the register.

3. The drainage of all buildings, public or private, and the alterations of the same, shall be executed in accordance with plans and specifications previously approved, in writing, by the Board of Health.

4. There shall be a separate plan for each building, private or public, accompanied by specifications describing the drainage of said buildings on blanks, prescribed and furnished for this purpose, showing size and kind of pipe, also traps, closets, and fixtures to be used, the same to be placed on file in the office of the Board of Health, said drawings and description to be furnished by the architect or builder, where one is employed; and applications for a change in plan must be made, in writing, by the owner or his authorized agent.

5. Drawings and descriptions of the drainage of buildings erected prior to 1886 may be placed on file in the office of the Board of Health.

6. Blanks for drawings and specifications for drainage will be furnished on application at this department. One vertical drawing will be sufficient for a building where it can be made to show all the work; if the work is intricate and cannot be shown by one drawing, two or more shall be made.

7. When the drainage of buildings erected prior to 1886 has

been inspected and condemned, plans must be filed, and the new work or alterations shall be executed in accordance with these rules and regulations.

8. Plans will be approved or rejected within twenty-four hours when practicable, and under no circumstances will a delay beyond ten days be permitted.

9. All material shall be of good quality and free from defects, and the work must be executed in a thorough and workmanlike manner.

10. All soil, waste, anti-siphoning pipes and traps, inside of new buildings; also if entire new work in old buildings; or when alterations are made in old buildings, and the owner or agent of said building or buildings shall have contracted to have the drainage system tested; before being connected with fixtures shall have openings stopped, and a test of not less than three (3) pounds atmospheric pressure to the square inch applied.

11. The drain, soil and waste-pipes, and the trap, shall, if practicable, be exposed to view for ready inspection at all times, and for convenience in repairing. When placed within walls or partitions and not exposed to view, or not covered with woodwork fastened with screws so as to be readily removed, or when not easy accessible, extra heavy pipes shall be used at the discretion of the Department.

12. No drainage work shall be covered or concealed in any way until after it has been examined and approved by an inspector of this Department, and notice must be sent to the Department when the work is sufficiently advanced for such inspection.

It is recommended that while building, recesses shall be left in the walls for all soil or waste pipes of three inches or over.

13. The main drain of every house or building shall be separately and independently connected with the street sewer, where one is provided; and where there is no sewer in the street, and it is necessary to construct a private sewer to connect with one on an adjacent street, such plans may be used as may be approved by this Department, but in no case shall a joint drain be laid in cellars parallel with street or alley. All house drains or soil-pipe laid beneath the cellar floor shall be of proved tar-coated, extra heavy cast-iron pipe, with well leaded and caulked joints, or of wrought iron, with screw joints made with paste of red lead and treated to prevent corrosion, or of first quality terra cotta pipe with joints of the best cement. All other drain, soil or waste-pipe connected with main drain, or where main drain is above the cellar floor, shall be of tar-coated cast iron pipe, or of wrought iron pipe with screw joints made with a paste of red lead and treated to prevent corrosion, properly secured and carried five (5) feet outside of house walls, or five (5) feet beyond vault, if any.

14. The house drain shall not be less than four (4) inches, and not more than ten (10) inches in diameter, and the fall shall not be less than one-half (½) an inch to the foot, unless by special permission of this Department; it shall be laid in a trench cut at a uniform grade, but, if of iron, it may run along and be properly secured to the cellar wall.

15. The arrangement of soil and waste pipes shall be as direct as possible. All changes in direction on horizontal pipes shall be made with Y-branches.

16. The house drain shall be provided with a horizontal trap placed immediately inside of cellar wall nearest to the sewer or at the curb. The trap* shall have a hand-hole for convenience in cleaning, the cover of which shall be properly fitted and the joints made air tight.

17. There shall be an inlet for fresh air, entering the drain just inside of the water seal of the trap, or at rear end of system, of at least four inches in diameter, leading to the outer air and opening at any convenient place with an accessible clean out.

18. Where the pipes pass through a new foundation wall, a relieving arch shall be built over it with a two (2) inch clearance on either side of drain pipe.

19. Every vertical soil-pipe shall extend at least two (2) feet above the highest part of the building or contiguous property, and should be of undiminished size, with the outlet uncovered except with wire guard. They shall not open near a window nor an air-shaft ventilating living rooms.

*If the trap on the main drain is placed inside of the cellar wall, the clean out of the trap must not be located between the water seal of the trap and the sewer.

20. The outlet of ventilating pipe of yard water-closet shall not be near a window nor an air-shaft ventilating living rooms.

21. Where a separate line of waste pipes is used, not connected with sewer pipes, it shall also be carried two (2) feet above the highest part of the building or contiguous property, unless otherwise permitted by this Department.

22. There shall be no traps, caps or cowls on soil or waste pipes which will interfere with the system of ventilation.

23. All drainage or anti-siphoning iron pipe shall be sound, free from holes, and of a uniform thickness of standard weights.

24. All joints in the cast-iron, drain, soil and waste pipes shall be so caulked with oakum and lead, or with cement made of iron filings and sal-ammoniac, as to make them gas tight.

25. All connections of lead with iron pipe shall be made with a sleeve or ferrule, put in the hub of the branch of the iron pipe and caulked in with lead, except in cases of iron water-closet traps or old work when drilling or tapping is permitted. The lead pipes shall be attached to the ferrule by a solder joint.

26. All connections of lead pipe shall be by solder joints.

27. Every water-closet, sink, basin, wash-tray, bath, and every tub or set of tubs, shall be separately and effectually trapped.

28. The trap must be placed as near the fixture as practicable. All waste pipes shall be provided with strong metallic strainers. All drains from hydrants shall be trapped, and in a manner accessible for cleaning out.

29. Traps of fixtures shall be protected from siphonage. All anti-siphon pipes shall be carried up and through the roof or connected with the main soil pipe above the highest fixtures.

30. Every anti-siphon pipe shall be of lead, of galvanized gas pipe, or of cast-iron pipe, tar-coated. Where these pipes go through the roof they shall extend two (2) feet above the highest part of the building or contiguous property; they may be combined by branching together those which serve several traps. These pipes, where not vertical, must always have a continuous slope, to avoid collecting water by condensation.

31. All drip or overflow pipes from safes under washbasins, baths, urinals, water-closets, or other fixtures, shall be by a special pipe run to an open sink, outside the house, or some conspicuous point; and in no case shall any such pipe be connected with a soil, drain or waste pipe.

32. No waste pipe from a refrigerator or other receptacle in which provisions are stored shall be connected with any drain, soil or other waste pipe. Such waste pipes shall be so arranged as to admit of frequent flushing, and shall be as short as possible.

33. The overflow pipes from tanks and the waste pipe from a refrigeration shall discharge into an open fixture properly trapped.

34. Every water-closet, or one line of water-closets on the same floor, shall be supplied with water from a special water-closet tank or cistern (the water of which is not used for any other purpose), except where the supply of water is assured.

35. Water-closets must not be located in the sleeping apartments of any building, nor in any room or apartment which has not direct communication with the external air either by a window or an air-shaft, having an area to the open air of at least four (4) square feet.

36. The containers of all water-closets must be supplied with fresh air and be properly ventilated, as approved by the Department.

37. Rain-water conductors shall not be connected outside of main trap, or used as soil, waste or vent pipes; nor shall any soil, waste or air pipe be used as a conductor. When connected with the house drain, or sewer, the conductors shall be trapped beneath the ground with a deep seal to avoid evaporation, and, if placed within the house, shall be made of cast-iron with leaded joints.

38. No steam exhaust or waste from steam pipes shall be connected with any house drain or soil pipe.

39. No privy vault, or cesspool for sewage, shall hereafter be constructed in any part of the city where a sewer is at all accessible.

40. No connection from any cesspool or privy well shall be made with any sewer, nor shall any water-closet or house drainage empty into a cesspool or privy well.

41. No opening will be allowed in the sewer pipe of any building for the purpose of receiving the surface drainage of the cellar, unless special permission is granted, and any opening so made

must be immediately and permanently closed when directed by the Department.

I hereby certify that the above Rules and Regulations were adopted and promulgated by the Board of Health of the City of Philadelphia, on the twenty-third day of February, 1886.

Wm. P. Troth, Chief Clerk.

LABOR CONDITIONS IN AUSTRALIA.

George R. Parkin has an article in the *Century*, in which he says:

"The position of the laboring man in Australia is unique. He has shorter hours of work, a higher average of pay, and more distinct and direct political recognition than anywhere else. The combination among workingmen to give effect to their views, are the most complete yet devised. Eight hours is the limit now fixed by custom for a working day, and the custom is so universal that no law is needed to give it force. The struggle by which this limit was secured in Victoria, took place as far back as 1856. On the main street of Ballarat, is a monument erected to the memory of James Galloway, there described as the "founder" of the eight hour system in Victoria, and he died in 1860. On the same monument is inscribed the Australian workingman's ideal, "Eight hours' work, eight hours' recreation, eight hours rest." To commemorate the triumph of labor, the 22d of April is observed in Melbourne as a festival under the name of the "Eight Hours' Day." A public holiday is proclaimed; the trades march in procession; the city corporation, the governor and the leading men unite in recognizing and giving significance to the general holiday. This is an epoch marked by a country which happily has no victories to celebrate but those of industry.

"The shortened day's work gives the artisan an opportunity for an evening's enjoyment. Almost universally in the larger towns but five hours work is done on Saturday. In the afternoon the workmen crowd to the public parks or gardens, to the foot ball or cricket grounds, or go upon excursions to an extent greater than I have ever observed elsewhere. They have time for amusements and money to spend upon them. Judged by all known standards, the workmen's paradise is here.

"One asks whether this position won by industry is permanent, or is made possible only by abnormal and temporary conditions.

"It is clear that Australia's economic history is quite exceptional. The country has never been crippled or hampered by wars. The native population was never numerous enough to make serious resistance to the occupation of the land, and British men-of-war on the coast have kept off all external danger. Never did people walk along safer paths to industrial prosperity. The product of gold alone between its discovery in 1851 and 1888, were nearly £300,000,000 sterling. In addition to this there has been a constant flow of British capital into the country for every purpose of speculation and enterprise. During the last twenty years a system of state borrowing for the construction of public works, has given a steadiness to the labor market not to be looked for under other circumstances. Meanwhile competition in labor has been lessened by the distance of the country from the great centers of European population."

That is a very pretty picture drawn from one side of the conditions of labor in that country. It is true except as to coloring, or rather as to shadows which so materially modify the high lights as here penciled. Yet it is just such an article as we would look for in our magazines whose writers wish to please by presenting such allurements and fascinations, and who think the common vulgar public have no right to know any better. We have grown used to such articles and are always provided with the necessary grain of salt with which they are to be taken. Should a day laborer go to that country in quest of work he would write a different story; he would put in the shadows to the above picture, and a very different effect would be the result.

The apprenticeship question has been placed so far in the back ground, and boy labor and all the incompetency of half qualified laborers has been brought so near the front, that a very different picture is presented to him who is in quest of work in the trades. It has not been very long ago that England sent over there a number of plumbers who had their contracts made before starting, with return tickets to secure their return to their homes. There is such a plethora of incompetent and inexperienced labor, while skilled labor is scarce. Throughout the building trades the status of trades unions is very low, and the predominance of this unskilled labor in the unions works unfavorable control of labor which disregards better counsels, and is tending to a dangerous sentiment in favor of a shorter experience at the trades, poorer qualifications in the workmen, and a greatly reduced standard of work. Complaints of this nature have already come from Mildura and the colonies where an immense amount of poor work is done.

It may be that this "workmen's paradise," the easy hours of labor, the lounging in the parks and public gardens, contribute to the causes that tend to the bad state of workmanship found there. Not that the eight-hour day is not to be enjoyed by the laborers, but, as it is not the creation of law, simply the outgrowth of custom, it may be that a loose custom in regard to the quality of work is an accompaniment of the other customs regarding labor. Whatever the cause, the bad state of affairs exist in regard to the character of skilled labor. Just recently a land boom in Melbourne brought to the surface a host of jerry builders who had graduated from the bench with little or no knowledge of any part of building. The competition resulting from this is not confined to skilled labor with unskilled, but the bona fida competent contractor may find himself to-morrow in competition with his employe of to-day, making a competition that is unnatural and unhealthy. As a result incompetent and cheap labor is sure to come with the accompanying low rate of wages.

CONVENIENT TO HAVE ABOUT.

Rubber ink erasers take away rust spots from polished cutlery without injuring the same.

The *Pharmaceutical Era* says that inflammable window curtains are made by soaking them in a saturated solution of sulphate of ammonium. The goods can be ironed the same as any other fabric.

It is stated that the toothache may be sometimes cured and usually alleviated by a weak galvanic current, which can be generated by placing a silver coin on one side of the mouth and a piece of zinc on the other. To increase the effect, rinsing the mouth with acidulated water will be found efficacious.

A German engineer has devised a new method for fixing a foundation under water. By means of a powerful blast of compressed air he drives powdered cement down into the sand or mud at the bottom of a stream. The action of the water immediately fixes the cement, and it becomes like solid rock,

A suspected joint in a sewer or drain pipe may be tested by wrapping it with a single layer of white muslin, moistened with a solution of acetate of lead. As the gas escapes through the meshes of the cloth, it will be blackened by the sulphur compound.

Brass which has been rendered hard by compression may be tempered the same as steel. To do this a piece of polished steel is placed on the article to be tempered, and heat is applied so as to affect the steel and brass equally. The temper of brass will be indicated by the color of the steel.

A rough estimate of the size of a boiler required to heat by steam a building of a certain size, may be obtained by allowing one square foot of heating surface to each 750 cubic feet of space in the building. This is approximate only, as a great deal depends on the systems used, the exposure of the walls, the pressure of the steam, and other things, but with this approximation it will be found that the boiler will do the work with fair economy.

Grease can be taken out of white marble by the application of whiting or fuller's earth saturated with benzine, and allowed to stand a little time after application, Another remedy is to rub well over the marble a mixture composed of two parts washing soda, one part ground pumice stone, one part chalk, all finely powdered and mixed into a paste with water, finaly washing off with soap and water.

Powder some lime and mix with a strong solution of potash, so as to form a thinnish paste. Apply this to stone and allow it to remain on for two or three days, then wash it off and repeat the application if necessary. This will free marble from stains, and,

if persisted in, will no doubt do the same with freestone. Keep the potash solution in a bottle, and mix fresh paste each time it is wanted.

Sulphate of copper is recommended for keeping posts and timber from decay. Telegraph poles in Norway are said to be preserved by boring inch holes about two feet from the ground and filling with the sulphate of copper crystals, afterward plugging the holes with wood.

In a paper, "Magnesia in Portland Cement," by R. Dyckerhoff (*Chem. Zeit.*) the author, who has already pointed out the dangerous character of cements rich in magnesia, their tendency being to expand slowly after settling, careful measurements of their expansion giving also only doubtful indications unless at least half a year has elapsed since gauging, says he is disposed to fix the maximum permissible amount of magnesia in Portland cement at 4 per cent, and the Association of German Cement Manufacturers has formed a committee to report on the subject; such makers as are using dolomitic material being specially interested.

Unnatural sweating of the feet is a very common and annoying affection. Although not positively "dangerous to life," it is certainly a malady which is not infrequently attended by serious results. Profuse sweating not only gives rise to chafing, irritation, and a mal-odorous condition of the feet, but constantly exposes an individual to the danger of taking cold, from the readiness with which the feet become chilled when moist, whether from natural perspiration or from wetting the feet with water. It is not surprising, then, that a question often asked the physician is, "Doctor, what can I do for sweating feet?" Here is a remedy which it is claimed has been used in many thousands of cases in the German army, and with almost unvarying success, more than forty per cent being cured, fifty per cent greatly relieved, and less than ten per cent not at all benefited: Wash the feet thoroughly with warm water and a little soap. Rinse with pure water, wipe dry, and then apply with a camel's-hair brush over the whole perspiring surface, a five-per-cent solution of chromic acid. This solution can be obtained at any drugstore.

"HOW CAN WE BETTER OUR CONDITION?"*

This is the question we are to consider to-night, and there is no question of more practical importance to us, as plumbing contractors. What condition do we need to better? No one will deny that our moral condition could be improved without doing us any harm, and might be of great benefit to our customers, and probably our sanitary condition might be bettered by more frequent use of the plumbing fixtures via the bath tub and basin.

But the principal condition that we want improved is our financial condition; but if our customers knew we had met to-night to consider especially this subject, they, no doubt, would think their financial condition had a very poor outlook, but we know from the experience of the last two or three years, especially, that something ought to be done that we may get better prices on contract work. Plans have been suggested and adopted to this end, but none have been considered a success in our experience, and this complaint of low prices is common with the craft to-day. There are some methods that might be adopted and would tend to help us out of the dilemma. If they could be carried through, and almost any plan that might be adopted would be violated by some. But let us not be discouraged, for by agitation and discussion the end will be accomplished.

There is no reason why a plumbing contractor should not have a living profit on his business as well as the merchant who gets from 35 to 100 per cent. on his goods, and we should be paid for our time and talent as well as they. Our business if properly managed, requires the closest thought and attention, and we should be compensated for this. Good business men are willing to pay a living price to have their work done properly, knowing that it is cheaper for them in the end than cheap work.

One thing that would lead to better prices, as well as better class of work, would be to do less figuring with general contractors. While we find a number of these contractors worthy, reliable men, we find others who get our bids on the jobs they are figuring on and give them to the man they want to favor in order to get him down in price, and they care not how the work is done. In this and other ways that might be mentioned, the business is degraded and prices ruined. Under the late decision of the Supreme Court in this state relating to mechanics lien law, we see the importance of making our contracts with the architect or owner. In this way we will be more likely to get our pay when the work is done, as well as better prices and better work.

Another thing that would benefit men who want to do good work, would be a standard rate for labor on contract work. One man will keep good mechanics, pay good wages and figure on doing his work with this kind of labor, while another will hire cheap men and boys and figure on doing work with this kind of labor in competition with the other man. What chance has the first man in figuring with the second? So, if we had a standard price on some practical plan, good might be accomplished. Good work, done by good workmen, at a good living price, is what we need. How can we accomplish it? I wish to say right here that, while the Journeymen's Union may have some objectional features, I think it deserves some recognition. We find the best workmen are in it, and our experience is that they have a great many members who are good reliable men, and by treating them as men should be treated great good would be the result, both to them and ourselves. If we are men of honor, we want men of honor to work for us, but if we are not, we cannot expect our men to be better than ourselves, and one way to make a man better is to treat him right and set him a good example.

There are a great many methods that might be adopted in order to better our condition; but after all a man must stand on his own merits, if he has any, and if not, he must stand on some other's.

We are justly entitled to at least 25 per cent. gross profit on the average contract and should not figure less than that if we expect to pay our bills, and make anything of our business. The man who is not willing to pay the plumber a fair price for his services, is likely to pay the doctor a fair price for his at least, especially if he occupies the house where the cheap plumbing is done; so the money will circulate any way and the plumber's bill is the cheapest after all who does good work at good prices.

Another thing is protection. I claim that when our supply houses comply with the Baltimore resolution, viz., that they sell to the trade only, they are not injuring our business nearly as much as our own members, who are taking contracts below living prices, if not below cost, and instead of harping at these supply houses we would better use more effort to get our members to use more business judgment in this part of the business.

Another matter that would be of benefit to us would be to have a commercial rating of our bad customers, viz., "dead beats," and we call them ours, not because we like to, but because we have a cash interest in them that we would like to sell. As a sample, I might mention Jackson, the barber, who in the last two years has taken advantage of four of our members to my knowledge in about the same manner. Now if we had a rating for such customers, we could have saved three of these four from having this cash interest in the barber business with this Mr. Jackson. As I do not think these gentlemen care to have an interest in this business, it would not have been doing them any injustice. The Scott Commercial Agency has a credit guide that is good and well worth its price. Also there are others said to be equally as good by those who have used them, and as it is important to be able to collect our bills as well as to get better prices, it will pay to have these ratings and examine them closely.

These are a few scattered thoughts I found by the way, and as Mr. Yates is expected to have the essay of the evening, I will not occupy your time further at present.

*Read at a meeting of the Kansas City Master Plumbers by David M. Quay, March 10, 1891.

VENTING BASINS.

Chicago, April 8, 1891.—Editor The Sanitary News: Knowing from past experience that the News was always willing and ready to promulgate any items that would be of interest to the plumbers or conducive to public health, I wish to relate through your columns a case that I had my attention called to some time ago. The occupants of a building complained of a strong odor in the kitchen when the wind blew strongly from the

east. I examined the premises and found that the main sewer emptied into the lake about three blocks from the house drain connections. I came to the conclusion that the wind compressed the air or gases in the main sewer and branches connecting to the catch basin, thereby increasing the column of water in the basin and forcing the gases through the sink and laundry tub traps which are revented as the ordinance calls for. There are also two 2-inch pipes and one 1½-inch pipe connecting with the 6-inch iron pipe that leads to the catch basin, said pipes extending through the roof. The basin is four feet from the kitchen window, stone top, iron cover, yard stone flagged. I came to the conclusion that the best and most practical way to prevent a repetition of the trouble was to put a perforated cover on the basin. I mentioned the case and proposed remedy to some of my fellow craftsmen and they thought the gases from the basin would pass through the cover into the kitchen when the window would be open. I told them I did not think so as in this case the pipes extending through the roof would create a current that would always keep the air in the basin so pure that a candle would continue to burn in it at any time, proving that there could not be any deleterious gases in the basin but they did not believe it would act that way. I put on the perforated cover, and two weeks after I lowered a candle into the basin; it continued to burn as brightly as it would on the surface. I think it would be a great improvement if all basins were vented at the surface by a perforated cover or an eight-inch pipe; it would prevent any back pressure by the generation or accumulation of gases when the basins are sealed or the vents to roof are frozen.

Respectfully yours, P. Harvey.

SANITATION IN DETROIT.

Whter Office, Detroit, April 2, 1891.—Editor The Sanitary News: Will you please give place in your columns for the following extract from my address to the plumbers of this city the 28th ult., upon the occasion of their being assembled for the purpose of electing three of their number as an Examining Board, of which certificates of ability must hereafter be obtained before licenses are granted.

Yours respectfully., L. N. Case, Secy.

"I desire now, gentlemen, to call your attention to an article that appeared in The Sanitary News of March 7th, written by a Detroit plumber, and is as follows:

(The article, "This, That and the Other," was then read.)

"It is hardly necessary to comment upon this article at all, and certainly would not be were it not for the fact that it is published in a reputable journal of wide circulation, and no doubt has the effect of misleading the public generally as to the real character of plumbing in the city of Detroit, and also as to the sanitary condition of our streets, alleys, factories, etc.

"In regard to that portion of the communication on myself, I have simply this to say, that the writer, having been an employe of the Board of Water Commissioners all of last summer, had good reasons for knowing that he was speaking falsely. I think I may say without egotism, that every act of mine as Secretary of the Water Works bears testimony to the fact that I am actuated only by the desire to have the water works of the city of Detroit conducted as economically as possible, and to exact from the people simply what is sufficient to accomplish this purpose.

"The writers general remarks upon the filthy condition of our city and the rottenness of its plumbing can only be met by a general denial of their truth, but the special charge which he makes against one of our most enterprising citizens, a man who has done more to build up our manufacturing interests and to enhance our commercial prosperity than any other man in the city—this can be met by something more than a mere denial.

"Superintendant Putnam and myself, previous to this meeting, took the trouble to visit this so-called "slaughter house," and found the following facts: The works, referred to, occupy about thirty-six acres of ground on Clark avenue, which are covered over with work shops, every one of which is entirely open to the purifying effects of the winds that blow, and occupied to-day by 2,000 workmen who receive not less than $1.10 per day and up to $3.50.

"There are no main sewers near these grounds although one is in course of construction at the present time.

"For the use of the men there are five large stone vaults provided, in which disinfectants are used regularly and systematically, and as often as once in two months at least, these vaults are thoroughly cleaned and the offal carted away.

"We visited and examined these vaults and though we found them just upon the point of being cleaned, no particular stench came therefrom, until we stood directly over the vault itself, and then it was no more offensive than that from thousands of outhouses that are drained into the sewers.

"What more could be done by the proprietors of this establishment in the way of sanitation, situated as they are, I cannot conceive, and I believe that this attack upon them is totally uncalled for, and not justified by the facts in the case. I also ascertained that the percentage of those absent from the shops sick from all causes is about one in one hundred.

"This practice of digging the skeletons out of our closets and increasing their ghastliness by the use of red rags and blue lights, holding them up where all the world may see, cannot in my opinion be too severely censured.

"If we have faults, let us correct them; if there are diseases, let us heal them, and not, as this writer has evidently tried to do, make the world believe that there is no good in us."

"SALUTATORY."

Cincinnati, April 11, 1891.—Mr. Andrew Young: The subscriber doffs his chapeau, with becoming grace and dignity, and none is more ready than he to make the proper salaam to one so mighty as wields the pen. I have read your address in The Sanitary News with much pleasure. Surely the millenium is upon us when the once poor and despised plumber is being recognized for high places in "swell communities," and can take his seat upon the throne and sway the populace with burning words of wisdom; and verily, why not? Truth is mighty and will prevail.

I have been preaching this gospel the past twelve years, that the plumber was not a wooden man, bar of lead, a robber or a thief, and that some "sweet day," when he ceased to think himself the chump that people had almost persuaded him he was, he would rise up and measure swords with the best of them. I am inclined to think the day is near at hand when such knowledge as I know some of our leading men in the trade to possess will be fully recognized and appreciated, and I am proud, my friend, to see such service as I know you to be capable of rendering appreciated by your fellow men in the community in which you live. May I admonish you to look well after your own bearing and show by precept and example your worthiness to fill such a high place in the confidence of your people? You have my very best wishes for success in your new calling, and in this I am sure I but voice the sentiment of all your friends in this vicinity. While I have but little interest now in the practical affairs of plumbing, I am keenly alive to its importance, and recall many pleasant memories of the past in my associations with the real live men in the work, yourself not the least.

Very truly, Jas. Allison.

THE LADIES' AUXILIARY ASSOCIATION.

Those Master Plumbers of Chicago who were fortunate enough to receive invitations to the social and dance given by the Ladies' Auxiliary Association on the evening of April 14th, anxiously awaited the great treat in store for them on that occasion, and the writer can safely state for all who attended that the entertainment far surpassed all the other delightful socials given by this organization. The invitations directed the guests to Emerson Hall at 45 E. Randolph street, and stated that the festivities were to begin at 8:30 P. M. The company supposed before entering the hall that the entertainment was merely to be one of the many delightful gatherings held by the ladies in time past, but on entering the door the following lines in large black letters announced the occasion of the social in these appropriate words: "Social and dance given by the Ladies' Auxiliary Association in honor of Mr. Robert Griffith, president of the National Association of Master Plumbers." The worthy president seemed to be more surprised than any one else at this announcement, and did not recognize his own name at first, but it finally dawned upon him that he was the

honored guest of the evening, and he soon accommodated himself to the circumstances.

Bewitching music and an elegant floor had been prepared for those who desired to trip the light fantastic, and the large hall was soon filled with the chivalry and beauty of the plumbing profession in the mazy waltz. After several numbers of the long musical program had been rendered, the guests were invited to sit down to a sumptuous repast which experience had taught the ladies never failed to delight the master plumber. When the viands had disappeared, the company became impatient to hear a speech from President Griffith, and at the formal request of Mrs. J. J. Hamblin, who is president of the Ladies' Association, the National President was escorted to the platform by Mrs. A. W. Murray and Mrs. Andrew Young. Mr. Griffith made a worthy speech which was fitting for the occasion, and wound up by thanking the ladies in a very happy manner for the honor they had bestowed upon him.

Music and dancing were the next in order which was uninterrupted until an early hour next morning, when the guests very reluctantly retraced their steps to their respective homes.

Among those present were Messrs. and Mesdames Robert Griffith, J. J. Hamblin, A. F. Irons, Andrew Young, A. W. Murray, Hugh Watt, Charlie Breyer, Charlie Herbert, Patrick O'Hara, M. L. Mandable, J. H. DeVeney, Dr. Robert Tapley, Chas. Cavanah, J. D. Bray, Miss Julia McCauley, Mrs. Jas. Wood, Mrs. Wm. Bowden, Miss Dieter, the Misses Watt, W. H. and A. M. Watt, the Misses Young, Miss Schawb, Alexander and Milton Murray, Miss O'Hara, Thomas H. Conner, Miss Allie Bowden, Mr. Bowden, Miss Eva Hamblin, Mr. Wm. Gay, Master Geo. Irons, Mr. D. Bain and Miss Minnie Bain.

The officers of the association are Mrs. J. J. Hamblin, president; Mrs. Andrew Young, vice-president; Mrs. A. F. Irons, secretary; and Mrs. A. W. Murray, treasurer. The society is in a flourishing condition, and its recent successful entertainment is evidence that it ever strives to surpass its last triumph in the art of entertaining.

PLUMBING NOTES.

The partnership heretofore existing between Weber & Weppner, plumbers and gasfitters, at 244 North Clark street, has been dissolved. Mr. Weber remains in business at the old stand, and Mr. Weppner goes into business at 1381 North Clark street.

The Wisconsin Legislature is death on bills providing for the health and comfort of the people. It killed the bill regulating plumbing inspection in Milwaukee, and now has knocked out the bill regulating the smoke nuisance in that city. What is a Legislature for anyway if it is not to kill bills the people advocate?

George C. Tarrant, Secretary of the Gas and Steam Fitters' Union, has received some replies from the notice sent out a few days ago inviting suggestions on the advisability of calling a national convention of plumbers, gas and steam fitters for the purpose of forming a national organization.

The Board of Health of Indianapolis, Ind., have determined on having a Plumbing Inspector. A meeting is to be called to prepare an ordinance creating the office of Inspector of Plumbing. This ordinance will be passed by Council and the board aims to secure a first-class man for the position, if it is permitted to pay a good salary. The duties of the office are varied but relate entirely to plumbing matters.

The sanitary inspection of Mobile was begun last week, Officers Clonan, Cummings, Hood, McKean and Delhomme being detailed to assist Sanitary Officer Drago in the work. Every yard and house will be closely examined, and a thorough cleaning of the premises required.

The Board of Public Works of Milwaukee, has awarded the Wittig Plumbing Company a contract to furnish state partitions in the closets at the new Sixth and Eighth Districts schools.

The matter of a sanitary exhibit at the World's Fair is important enough to receive general discussion. As the plumbing fraternity have always been in the advance of sanitary progress it is proper and natural for them to take hold of this subject with their characteristic energy and intelligence. We would be pleased to hear from them in regard to this exhibit, for their suggestions will go a great way with those who have the matter in charge. There should be no question as to whether we should have such an exhibition or not. Its importance demands representation, and the question now should be how best to make such an exhibit a success—not merely a show, but a presentation of the progress and claims of sanitary science that will be commensurate with its triumphs and importance. We will be glad to publish the opinions of plumbers on the subject.

The Indianapolis plumbers came to an agreement last week. First-class workman are to receive 40 cents an hour and second-class men 30 cents. Eight hours are to constitute a day's work. The employers are not to discriminate against union men. They may retain the present non-union men and employ others in case of an emergency. The gas and steam-fitters who asked for 30 cents and 35 cents an hour, finally concluded to go to work at as good prices as they can get from individual employers, without a fixed scale. The present pay of gas and steam-fitters is generally 25 to 31¼ cents. By the plumbers' agreement, boys must hereafter serve for two years as helpers and three years as apprentices before becoming journeymen.

The Chief Inspector of Atlanta, Ga., made an average of three visits to 1,202 plumbing jobs during the last year, and the four inspectors served 10,434 notices to abate nuisances of various kinds.

When the sewer bubbles through the open sink.
And you have the troubles of a noxious stink,
Go and get a plumber as tight as you can lap,
And he will stop the bubble, that is giving you your trouble,
With his graceful curving, scientific trap.

Nothing mortal is immutable. Change is the universal law and can be predicated of all human institutions. Time works ruin and decay, and increasing watchfulness and repair are necessities. As the building in which you live will need attention, so will every part of it. Do not neglect the plumbing. Keep it in good repair. Look after it or have it inspected by a good practical plumber and all defects promptly repaired. This will cost but a trifle, but neglect may cost a big bill for remodeling and that which is vastly more, your health.

I will not have a plumber,
For I do not like his bills;
I will get a modest tinner
To remove those plumbing ills.
Oh! that horrid, horrid odor
Where should be the scent of summer,—
I will not have a tinner,
But will straightway for a plumber.
And the plumber came with his tools and his skill,
And the house is as sweet as the breath of June still.

There are a great many city ordinances which recognize the important functions of the plumber in building construction and the genereal sanitary interests of cities. These are long strides in the way of the plumber to a more general public and official recognition. Our city officials, boards of health, and law makers are beginning to recognize the value of plumbers' qualifications as sanitarians.

Comes the summer
When the plumber
Can take his fishing rod and trusty gun,
And hie away
On some bright day—
And leave his bookkeeper to send the dun.

John W. Potter, building inspector of Jamestown, R. I., has had his salary raised from eight dollars to fifteen dollars per annum, and for all that has not lost his head amid the pomp and splendor of wealth and luxurious and voluptuous affluence that attend his princely income.

From the sink there rose a stink
Noisome and ill;
And the tinner was the winner
By a handsome bill.
But the smell is faring well
And will all summer;
Unless there come that way to plumb
A first-class plumber.

Joseph P. Roch, one of Mr. Young's inspectors, died very suddenly last week of pneumonia. The funeral was held last Sunday, which was attended very largely by the members of the plumbing profession.

Chas. Herbert will move his shop on May 1st from 120 to 100 Randolph street.

Mr. Cavanah has been laid up for six weeks with inflamatory rheumatism, but is able now to be out again.

T. P. Culloton is recovering slowly from la grippe, and may be found now at his new shop on North Clark street.

Mr. Hugh Watt was able to attend the social given by the Ladies' Auxiliary Association on Tuesday evening.

The many friends of Louis Bain will be glad to learn that he has regained his health in the Sunny South sufficiently to return to his old home on the West Side.

La grippe has been playing havoc with a great many plumbers, but the majority of them are getting around all right at present.

Nearly all plumbing firms of Milwaukee, Wis., are declining to contract for new work before May 1, on account of the unsettled condition of the labor market. At present the journeymen plumbers are working eight hours a day, and their wages are $2.80 per day for first-class, and $2.33 for second-class men, but they are not satisfied with these wages and intend to hold a meeting in a few days to fix a new scale, to take effect May 1. On this account, not knowing what demands their employes will make, the master plumbers decline to make contracts.

"I'm a busy-body germ,
A microscopic worm,
And I slip in the house from the sewer through the taps."
Thus it said.

"I'm a scientific plumber,
And somewhat of a hummer,
And I'll catch you busy-body germ in my traps."
And he did.

WHERE PLUMBING WORK IS BEING DONE.

Armitage bet. Mozart and California ave., Hogan; Ashland ave., and June street, C. C. Breyer; 4943 Atlantic, A. Miller; Artesian ave. cor. Fulton, O. T. Russell; 6340 Aberdeen, A. Miller; 3200 Armour, J. K. Moran; 44 Bosworth ave., George Hauslein; Bonney cor. Twenty-fourth, J. R. Mills; 611 Baker, A. Miller; 39 Bosworth ave., G. Stauder; 4042 Butterfield, F. N. Kuhn; 916 Belmont ave., J. Schner; Bradley and Halsted, J. Schner; 198 Carpenter, G. Stokes; 20 Clara place, Garner & Bahn; 252 W. Chicago ave., C. C. Breyer; 1340-54 Congress, W. H. Cummins; 327 Clybourne ave., John Wallace; 24 Clifton ave., Bayha & Bachman; 6850 S. Chicago, D. Walsh; Congress and Kedzie, J. H. Beane; 139 Cornell, W. J. Muller; Centre cor. Erie, O. F. Russell; Champlain and Seventy-first, D. Walsh; Corlin ave. S. of Eighty-second ,John Hardin; 3334 Calumet, R. H. Lear; Champlain ave. bet. Forty-seventh and Forty-eighth, R. H. Lear; Chicago and California ave., Bauman & Bro.; California and Twenty-first, C. Kostlevy; 21 Commercial, J. J. Geiss; 711 Dickson, George Hauslein; 414 Duncan park place, Zapper & Murphy; 6512 Evans ave., Sheville; Englewood bet. School and Stewart, Lyon & Lee; 1553 Elston ave., Garner & Bahn; 778 Elk Grove ave., J. F. Bunting; Eighty-first and Duncan ave., John Hardin; Evergreen ave. and E. of Robey, J. J. Geiss; 793 Elk Grove ave., J. T. Bunting; 943-5-7 Fairfield ave., Harvey & Mose; Forest ave. N. of High R. Road, Henry Baur; 173 Forty-seventh, D. W. Burns; 29 Forty-third, D. W. Burns; 539 Flournoy, W. H. Cummins; Fulton and Homan, W. H. Cummins; Fifty-ninth W. of School, Matt Weber; Fiftieth near Madison ave., R. H. Lear; 1917 Forty-seventh, Colter & Sons; Fifty-ninth E. of Halsted, J. J. Doyle; Forty-seventh and Evans ave., R. H. Finn; 483 Fullerton, Garner & Bahn; 534 Fifty-eighth, D. F. Dewar; Fiftieth and Madison ave., D. F. Dewar; 3630 Fifth ave., J. Conrath; Fulton and Short, Bauman Bros.; 104 Fisk, Krechner & Keerz; 1239 Fulton, Foskett & Brown; Fulton W. of Sangamon, Sims & Son; Forty-fourth and Dearborn, J. C. Arnst; Forty-seventh and Ashland ave., J. C. Arnst; 475 Forty-second, J. Thomlinson; Fifty-first and Wallace, J. J. Curtin; 532 Franklin, Bayha & Bachman; 1651 Greenshaw, Hamblin & Co.; 980 Gross ave., H. Breyer, Jr.; 1619 Grace, Val Ruh; 5139 Halstead, M. Stack; Humboldt S. of Armitage, Hogan; 6612 Honore, Dewar & Co.; Hoyne ave. near Potomac, C. C. Breyer; 3-17 Huron, A. A. Sommers; 310 Horner, H. Breyer; Humboldt cor. Sheridan, Garner & Bahn; 117 Hoyne, E. Sheehan; 882 Hoyne, P. Gow; 223 Humboldt, P. Gow; 848 Humboldt, P. Gow; Indiana near Robey, J. Jack; 81 Kendall, Brooks; 1130 Kedzie, Garner & Bahn; Kuhl place, Harvey & Mose; Kingston, D. Walsh; 1130 Kedzie ave., Garner & Bahn; 148 Lytle, J. Walsh; 1409 Lexington, W. H. Cummins; 580-82 Lasalle, Val Ruh; Langley, bet. Forty-second and Forty-third R. H. Lear; Lawndale ave. and Thirteenth, J. H. Shannon; 5900 Lasalle, A. C. Pagel; Lasalle bet. Fifty-third and Fifty-fourth, A. C. Pagel; 5637 Lasalle, E. T. Sanford; 4346 Lasalle, Connors; 935 Mitchell, Hogan; 856 Mitchell, Hogan; 5319 Madison ave., Nash & Hanna; 5803 Madison ave., Sheville; 24 May, Schuster & Bro.; Milwaukee ave. and Irving park, Garned & Bahn; Mead S. of Armitage, Garner & Bahn; 855 Maplewood ave., Harvey & Mose; 1052 Mariana, Geo. Hauslein; 733 Madison, Sims & Son; 390 Morgan, J. H. Shannon; Morgan and Lawndale ave., J. H. Shannon; 5322 Monro ave., J. J. Rourke; Michigan ave. near One hundred and fifteenth, Geo. Pieffer; Michigan ave. near Sawyer, Geo. Pieffer; Milwaukee ave. and Carpenter, Wm. Herbst; 58 Moffat, H. Breyer; 276 Mozart, Garner & Bahn; 451 Marshfield ave., McDonald; Monroe and Lincoln, Foskett and Brown; 235 Maxwell, C. Kostlevy; 556 North ave., C. C. Breyer; 815 North ave., P. Gow; Oakwood boulevard bet. Langley and Cottage Grove ave., R. H. Lear; 110 Ogden ave., W. C. Brown; Parnell ave., bet. Thirty-eighth and Thirty-ninth, Morrow; Potomac and Davis, Nelson & Culhoffen; 5840 Prairie ave., J. M. Collins; 6637 Peoria, Zapper & Murphy; 71 Perry ave., Garner & Bahn; 5041 Prairie ave., R. J. Powers; 619 Root, M. Weber; 810 Rockwell, Harvey & Mose; Racine ave. N. of Belmont, P. Gow; Sacramento bet. Walnut and Lake, Coolidge; 44 Sherman, P. Schmdt; 1240 Seminary place, John Wipner; 882 Shoper, P. Gow; 542 Thirteenth, Krilchner & Kurz; 779 Twenty-Second, Renn Bros.; Fremont and Wright, Dewar & Co.; Twelfth and Albany, Sam Smith; Twenty-sixth and Portland ave., E. Douver; 195 Thirteenth, Bustman; Twenty-second and Clifton park ave., Franstead: 3149 Union, Teutch; Vernon ave. and Thirty-seventh, D. Whileford; Winter S. of Logan, M. Stack; Washtenaw, Hogan; 275 Wood, McGinlev; 3743 Wallace, Kendrick; 5141 Wabash, Nash & Hanna; Wright and Fortieth, Gleason; Woodlawn N. of Fifty-fifth, J. Hardin; 1272 Western ave., Geo. Hauslein; Roseland place near Clark, Griffiths; 81 Ruble, Dornbos Bros.; 1036 Rockwell, H. Breyer; Roby and Augusta, Bauman Bros.; 1073 Roby, P. Gow; Sixty-sixth and Wabash ave., F. M. Kuhn; 688 Seymour, Harvey & Mose; 72 Seward, Bowden; 4452 School, H. Bubach; State and Sixty-Seventh, D. Walsh; Seventy-eighth W. of Halsted, Dewar & Co.: 14 Sacramento, W. H. Cummins; State, M. Webber; 721 Sixty-second, Sherman & Bennett; State bet. Forty-fourth and Forty-fifth, G. J. Feldkamp; State cor. Fifty-ninth, Lyon and Lee; 4442 School, A. Miller; St. Helen, Garner & Bahn; Seminary ave. and Roscow, Halfin; 667 Southport ave., T. Falk; 132 Sacramento, Jurgenson; 61 Willow, H. Bauer; 997 Western ave., H. Breyer; 1347-49 Wolcott, E. Sheehan & Co.; Wood & Emily, Bauman Bros.; 18 Willow, Gunderman Bros.; 7216 Yale, Dewar & Co.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: C. M. Palmer has planned for Potter Palmer a block of 4-story dwellings to be erected on Cedar street near the Lake shore drive; cost, $375,000. Also a 2-story residence for J. Y. Calanan to be built in Kenilworth; cost, $6,000. H. P. Harned has designed a 4-story store and flat building to be erected at the corner of Evans avenue and 47th street by A. A. Turner; cost, $100,000. Patton & Fisher are preparing plans for a 2-story and basement public library building at Kalamazoo, Mich.; cost, $60,000. Also for Grace Episcopal church to be erected at Grand Rapids, Mich.; cost, $20,000. W. J. Barfield has designed six 3-story and basement dwellings, to be built on Lake avenue near 45th street, by Ayer & Love; cost, $35,000. Robert Rae has planned five 3-story and cellar houses to be built on Oakenwald

avenue, near 45th street, by George A. Otis; cost, $35,000. L. B. Dixon has planned a 3-story and basement flat building to be built at the corner of Bowery street and Tilden avenue by F. C. Going; cost, $20,000. Pond & Pond are preparing plans for a 2-story and basement residence for Mrs. Laura Jones, to be built at Burlington, Iowa; cost, $10,000. Frank Lively has planned a 3-story and basement flat building to be built at the corner of Wallace and 32d streets; cost, $15,000. Beers, Clay & Dutton a 6-story addition to the Montgomery Ward building on Michigan avenue; cost, $75,000. They have also designed for W. A. Giles a 3-story hotel and flat building to be erected at Austin; a 3-story residence for David Quigg, to be built at Kenwood; for R. P. Smith, a 3-story residence to be erected at the corner of 53d street and Lexington avenue, to cost $12,000. Beman & Parmentier have prepared the plans for a 3-story club house for the Sheridan club, to be erected at the corner of Michigan avenue and 42d street. The exterior will be of brown pressed brick and stone; cost, $50,000. They have also planned a 3-story and basement office to be erected on State street near 20th, for the Chicago City Railway Co.; cost, $20,000. W. L. Carroll has designed a 4-story apartment house to be built at 459-461 LaSalle avenue, by R. A. Griefhagen; stone construction; cost, $15,000. G. Isaacson has planned three 2-story and celler flat buildings, for J. A. Anderson, to be erected at 1216-1220 Marianna street; cost, $10,000. W. A. Arnold has designed an edifice for the Congregational Society at Austin.——New York City: Schneider & Herter have designed for Weil & Meyer eight 5-story brick, stone and terra cotta flats with stores, to be built on the east side of 8th avenue, between 15th and 16th streets, at a cost of $276,000. George Keister has designed for Alexander Moore three 5-story flats, to be built on the south side of 51st street, east of 8th avenue, at a cost of $66,000. Schneider & Herter have designed for Weil & Meyer a 7-story factory, to be built on Division street, near Essex, at a cost of $32,000. P. Wagener has designed for Wm. C. Frohne three brownstone, brick and terra cotta flats, to be erected on the north side of 68th street, east of 9th avenue. George Keister has designed for E. D. Bertine ten 3-story and basement dwellings, to be built on the south side of 136th street, 150 feet east of Willis avenue.——Philadelphia, Pa.: Patrick Heron will build seven dwellings on the east side of Philip street, south of Ontario. Two large houses will be built at Nos. 815 and 817 Corinthian avenue by William J. Welsh. A 3-story stone house, 46x30 feet, will be built on the south side of Upsal street, west of Germantown avenue, by Martin Hetzel. St. Luke's Reformed Episcopal church will erect a handsome new edifice at Frankford. William C. McPherson & Sons have the contract for the erection of a guild house at Twenty-second and Sansom streets for the societies connected with St. James' Church. Fourteen dwellings will be built on the west side of East Second street and two on the lower side of Hancock street, north of Snyder avenue, by Brennan & Bro. Contractors have been invited to estimate upon plans for the new Century club house by Miss Minerva Parker, the architect. The Avil printing house, at Fortieth and Market streets, will be enlarged after plans prepared by Architect David S. Gendell. Eight 3-story houses will be built on the east side of Carlisle street, north of Poplar, by Benjamin Ketchem. A 2-story preserving house, 92x145 feet, will be erected at the northeast corner of Eighth and Berks streets by J. O. Schimmel. A 2-story factory, 28x63 feet, will be erected on the south side of Orleans street, west of Frankford, by Henry Gill. Ten small houses will be built on the east side of Fourth street, south of McKean, by John J. Cassidy.——San Francisco, Cal.: Edward Barron will erect a 7-story fire-proof structure at the corner of Market, Eddy and Powell streets, which will cost about $800,000. Chas. I. Havens, architect. A contract amounting to $50,000 has been let by Wright & Sanders for the Scott Library building of the Theological Seminary at San Rafael. Dr. F. W. Harris is erecting a 3-story residence, to cost $8,000, at the corner of Devisadero and Haight streets; J. H. Littlefield, architect. A hotel building of 80 rooms is being erected for the American Land & Trust Company at Larkspur; cost, $22,000; J. H. Littlefield, architect. The Methodists have invited plans for a handsome church which they propose building on Van Ness avenue, near Bush street. Grading has been commenced for a new building of four flats on California street, between Buchanan and Laguna; cost about $17,000; owner, Clinton Jones; architect, J. H. Littlefield. Architect E. Depierre has completed plans for a 3-story residence for G. A. Berton, to be erected on Mason street, between California and Pine; cost about $12,000.——Pittsburg, Pa.: Architect F. C. Sauer has plans for a brick store and dwelling to be erected on Gloster street, Twenty-third ward, for Charles Bingler. He has also plans for an addition to St. Mary's Monastery, located at Hermon station, Butler County. B. K. Waughter has the contract for erecting a stone residence for Mr. Oswald Werner, on North Hiland avenue. McVay, Walker & Co., iron founders, will erect a new foundry building, 90x450 feet. Architects Longfellow, Alden & Harlow, have plans for a residence for Mrs. Eveline Schwartz, on Penn avenue near Homewood. The house will be old colonial style. The contract was given to A. & F. Wilson. Architect J. E. Obitz has drawings for a frame house containing seven rooms, on Penn avenue near Brushton, for Mr. N. Hartman. This will be finished in handsome style. George Rodgers has the contract.——Washington, D. C.: Architect Joseph C. Johnson has plans for a 2-story and basement dwelling, 32x53 feet, that C. T. Bride will have built on B street, between First and Second streets, southeast; cost, $10,000. The same architect has designed a Baptist church to be built at Henderson, Ky.; cost, $25,000. Architect N. T. Haller has plans for a block of ten 2-story and cellar dwellings, that John Duvall will build at the corner of Harewood avenue and Elm street, Le Droit park. The block will cost, $30,000. Architect C. A. Harkness has plans for three 3-story and basement dwellings, 17x56 feet, that A. A. Wilson will have built on 20th street, between G and H streets, at a cost of $15,000.——Minneapolis, Minn.: Ed. Stebbins has designed a livery and flat building to be built for M. D. Wilson & Co., at 311-315 Second avenue; cost, $12,000. Warren H. Hayes has planned a wholesale store building to be erected at 252-256 First avenue for Samuel S. Thorpe; cost, $20,000. The St. Anthony Elevator Company will erect a grain elevator near the Manitoba Railway tracks, to cost $30,000. Barnett & Record furnished the plans. J. H. Record designed a 3-story store and dwelling for T. Thoralson, to be erected at 1816-1818 Washington avenue at a cost of $12,000.——Providence, R. I.: The city will build a 3-story brick school house; cost, $55,000.——Nashville, Tenn.: Fisk University will build a 4-story and basement structure for the new Theological seminary, to cost $50,000. Chas. D. Marvin, of New York City is the architect, and W. E. Griggs of Waterbury, Conn., is associate architect.——Vernon, Tex.: Wood & Tunnell have prepared plans for the Wesleyan college building, to cost $25,000. They are also preparing for a city hall.

HEATING AND LIGHTING.

Worthington, Minn.: An electric light system is being considered.——Great Falls, Mont.: The Belt Creek Water, Electric Light and Power Company, with a capital of $25,000, have filed articles of incorporation. The incorporators are E. G. Maday, Ira Myers and John G. Maday.——Columbus, Ga.: The plant of the Columbus Gas Light Company will be improved at a cost of $20,000.——St. John, N. B.: The People's Gas and Light Company has been incorporated with a capital stock of $800,000. Chas. E. Spiers is one of the directors.——Kensington, Ga.: An electric lighting plant for the city is being considered.——Elgin, Ill.: The American Gas Company will enlarge its plant and extend its service.——Pulaski, Tenn.: Immediate steps are to be taken towards establishing an electric or gas lighting plant at this place.——Lower Merion, Pa.: The Bala and Merion Electric Company, has been incorporated, with a capital stock of $28,000, for the purpose of supplying light, heat and power, by means of electricity. Incorporators Charles E. Hartshorne, Merion; George B. Roberts, Bala, and others.——Rome, N. Y.: The Gansevort Electric Light Company has been incorporated. A plant and works will be erected to light buildings, etc. The capital stock is $10,000; and James Stevens is president.——Uniontown, Ala.: An electric light plant will be established.

SEWERAGE NOTES.

West Newton, Mass.: Plans have been made for 1¾ miles of brick sewer and 16 miles of pipe sewer.——Winnipeg, Man.: The sum of $100,000 has been appropriated for sewers.——Brad-

dock, Pa.: Steps will be taken to improve the sewerage system. ——Baker City, Ore.: An appropriation of $30,000, for the sewerage improvements has been made——Seattle, Wash.: Benezette Williams, of Chicago, is preparing plans for a sewerage system. ——Corry, Pa.: The city contemplates putting in a main sewer and outlet, at a cost $75,000 to $100,000, this summer. Address C. P. Rogers, city clerk.——Eugene, Ore.: 'A large amount of sewerage work will be done here.——Reading, Pa.: Three large main sewers will be constructed.——New Orleans, La.: Major B. M. Harrod, City Engineer, has about completed plans for the construction of a covered culvert for Melpomene canal, extending from Camp street to the Dryades Market. He has also nearly completed plans for an open culvert. The base of the work will be of cement and brick. About $80,000 is available for the purpose; and if necessary more money can be secured.——Wilmette, Ill.: A sewerage system will be inaugurated.——Athens, Ga.: Bonds to the amount of $75,000 have been issued for the construction of a sewerage system.

WATER WORKS NOTES.

Noblesville, Ind.: J. W. Smith, Mayor, can furnish particulars in regard to a new system of water works.——Beardstown, Ill.: A system of water works will be put in. Address Mayor H. M. Schmoldt.——Altoona, Pa.: Paul Krentz Pointer of the Board of Trade can furnish information regarding contemplated improvements in the water supply system.——Portland, Ind.: A movement is on foot to construct water works.——Peru, Ills.: The people have voted to issue bonds to build water works, and work will be commenced in about 60 days.——Steelton, Pa.: James Gamble, of New York, is president of the company which will erect water works here.——Malden, Mass.: The sum of $25,000 has been appropriated to improve the water works system.——Waterville, Wash.: The Waterville Improvement Company, of which Capt. W. R. Ballard is president, will put in a system of water works.——Chatfield, Minn.: A special tax of one per cent will be levied for the purpose of furnishing a water supply system.——Sault Ste. Marie, Mich.: M. F. McDonald, City Recorder, can furnish particulars regarding the extension of water mains, and the purchase of an additional pump and stand-pipe. $20,000 will be expended.——Manitou, Colo.: It is proposed to expend about $6,000 on water works.——Worthington, Minn.: The city has voted in favor of water works.——Reading, Pa.: $150,000 will be spent in replacing all the small water pipe with larger pipe, and making repairs.——Jackson, Mich.: The question of appropriating $50,000 for water works extension is to be decided at a public election to be held soon.——Sumter, S. C.: The City Council has granted a 20-year's franchise for water works to Henry O. Read and others.——Centreville, Ia.: A $75,000 system of water works is contemplated.——Tacoma, Wash.: $80,000 has been subscribed for a Citizens water works company.——Ballinger, Tex.: A system of water works will soon be established at a cost of $16,000.——Seneca, Mo.: The water works question is being agitated. Rochester, N. H.: The State Legislature has passed a bill authorizing the town to establish water works.——Dayton, Wash.: Water works will be established at a cost of $75,000.——Kirksville, Mo.: There is talk of putting in a system of water works.——Riverdale, Ill.: The citizens are agitating the question of water supply.——Reading, Pa.: The Water Commissioners propose to issue $100,000 in bonds to improve the water distribution system.——Elwood, Ind.: A. O. Armfield, Clerk of the Water Work Board can furnish information in regards to proposed water works.——Wilmette, Ill.: Water works will be constructed.——Uniontown, Ala.: A water works system will be established.——Manchester, Mass.: The city has voted in favor of the issuance of $125,000 in bonds for the construction of water works.——Sheldon Ia.: Address H. M. Conant for information in regard to the new system of water works to be put in.——Mason, Mich.: The Legislature has authorized the city to issue $35,000 of bonds for water works.——Elmhurst, Ill.: $10,000 will be spent by the Elmhurst Water Supply Company in piping the village.

BIDS AND CONTRACTS.

West Newton, Mass.: Sealed proposals will be received until noon, April 23, by the sewer committee, office of the city engineer, for building 1¾ miles of brick sewer and about 16 miles of pipe sewer.——Noblesville, Ind.: Proposals are wanted until April 22, for the construction of a system of water works. Address J. W. Smith, mayor.—— Beardstown, Ill.: Proposals are wanted for the construction of a system of water works. Address Mayor H. M. Schmoldt.——Eugene, Ore.: The sewerage committee invite proposals to be received until noon, May 1, for furnishing standard made, vitrified salt glazed sewer pipe and connections, in sizes of 8, 10, 12, and 14 inches diameter, a sample, 12 inches in diameter to be forwarded for inspection by parties desiring to present bids. Joseph G. Kelly is city engineer.——Dayton, Wash.: Proposals will be received until noon of May 1, for the construction of a system of water-works to cost $75,000, and for furnishing material for the same. Address J. H. Day, chairman board of water works. ——Westfield, Pa.: Proposals are wanted until May 1, for pipe, hydrants, trenching, and a 500,000-gallon reservoir. Address J. H. Miller, president Westfield Water Company.——Wheeling, W. Va.: Proposals are wanted until April 23, for the erection, etc., of a 400-arc electric street light. Address A. A. Franzheim, secretory Electric Light Commission, as above.——Austell, Ga.: Proposals are wanted for furnishing an electric plant of 300 lights. Address Mayor C. J. Shelverton.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue, Chicago, Ill.

CHICAGO, MILWAUKEE & ST. PAUL RY.

Electric Lighted and Steam Heated Vestibuled Trains, with Westinghouse Air Signals, between Chicago, St. Paul and Minneapolis, daily.

Through Parlor Cars on day trains between Cnicago, St. Paul and Minneapolis.

Electric Lighted and Steam Heated Vestibuled Trains between Chicago, Council Bluffs and Omaha, daily.

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Solid Trains between Chicago and principal points in Northern Wisconsin and the Peninsula of Michigan.

Daily Trains between St. Paul, Minneapolis and Kansas City via the Hedrick Route.

Through Sleeping Cars, daily, between St. Louis, St. Paul and Minneapolis.

The finest Dining Cars in the World.

The best Sleeping Cars. Electric Reading Lamps in Berths.

6,100 miles of road in Illinois, Wisconsin, Northern Michigan, Iowa, Minnesota, Missouri, South Dakota and North Dakota.

Everything First-Class.

First-Class People patronize First-Class Lines.

Ticket Agents everywhere sell Tickets over the Chicago, Milwaukee and St. Paul Railway.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

KOCH'S LYMPH.

Dr. Koch's lymph will doubtless prove a great boon to suffering humanity, but it is yet in the experimental stage. The remedial value of the waters at Hot Springs, Ark., has been demonstrated. This great health and pleasure resort is reached directly via the Wabash road. Compartment sleepers Chicago to St. Louis, where direct connection is made with a double daily line of sleepers for Hot Springs. Berths reserved through.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

PLUMBERS' SUPPLIES.

The Whittaker Supply Co., 151 W. Washington street.

SEWER BUILDERS.

Dee, Wm. E., 116 E. Quincy street, Telephone 2992.
Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Boyd, T. C., 42 Dearborn street.
Breyer, E., 72 W. Randolph street.
Breyer, C., 833 Milwaukee avenue.
Canty, John, 3105 State street.
Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Klein, Stephen, 712 and 714 Milwaukee avenue.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Probasco, R. P., 36 and 38 Dearborn street.
Reilly, Joseph & Bro., 517 W. Madison street.
Roche, J. H., 208 Thirty first street.
Roughan, M. J., 25 Quincy street.
Ruh Valentine, 548 Wells street.
Sanders, P. & Son, 1413 Wabash avenue.
Schmidt, Ira T., 145 Michigan street.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN 25 years of age, eleven years' experience at plumbing and gas-fitting; considered a first-class hand, and a fast workman; have been in business for myself (up to Jan. 1st) nearly 5 years; understand drainage, drawing plans and estimating thoroughly; job in growing town in the South preferred. Must be steady. Address PHILADELPHIA PLUMBER, care THE SANITARY NEWS.

SITUATION WANTED AS TRAVELING SALESman in the line of plumbing or steam goods. Have had several years experience in retail store, can estimate any of this kind of work; strictly temperate. Address, R. B. this office.

SITUATION WANTED.—BY A YOUNG MAN who has had one year's experience with supply house in this city. Some expeaience with stock and is well acquainted with prices. Address R. J., care THE SANITARY NEWS.

SITUATION WANTED.—BY A YOUNG MAN as book-keeper in a plumber's office. Have had several years' experience in that line of business. Address, "M. F.," care of THE SANITARY NEWS.

WANTED.—A POSITION AS GENERAL SUPerintendent or foreman in plumbing establishment, by a Philadelphia practical plumber. One who understands the business thoroughly, and also the chandelier business. Has been in business and has been foreman in chandelier factory and has been plumbing inspector in Philadelphia. Can estimate from plans and specifications, and can draw plans. Address, W. 412 Greenwich St., Philadelphia, Pa.

SITUATION WANTED.—WITH MANUFACturer or Jobber in the supply business, by an unmarried man of good address. Have had seven years experience with the Plumbing and Steam Heating trade in the East and am rated as a salesman of ability. Can give reference. Address W. M., care of THE SANITARY NEWS.

SITUATION WANTED—BY A PRACTICAL man as book keeper in plumbing shop. Thoroughly understands the business. Address, F. D. GASSMERE, 3632 Wentworth Av., Chicago, Ill.

SITUATION WANTED—BY A YOUNG MAN to take full charge of a plumbing supply business. Has had ten years' experience and can furnish the best of references, as to character and ability. Address, "W," care THE SANITARY NEWS.

SITUATION WANTED—AS RETAIL GAS FIXture salesman, or plumber's book-keeper and collector. Might form a partnership with some practical plumber who is already established. Ten years' experience, abundance of references. Address, K. C., care THE SANITARY NEWS.

SITUATION WANTED—BY A PLUMBER, GAS and steam fitter; 22 years old; single; strictly temperate; served four years. Can furnish good references and would like work in or near Chicago. Address, "W. A. F.," care of SANITARY NEWS.

WANTED.—POSITION BY A GRADUATE engineer; three years experience in city work and one year as instrument man on railroad construction, fair draughtsman and letterer. Reference given. Address, Engineer, care THE SANITARY NEWS.

SITUATION WANTED.—A YOUNG MAN OF 19 desires a place to finish up his trade at plumbing and gasfitting; has had one and a half years experience. Address, J. H. S., 1018 Market St., Pottsville, Pa.

SITUATION WANTED.—By a married man, position as traveling salesman for plumbing, gas fixtures, or steam fittings; or would take charge of plumbing shop. Am a practical plumber and gas fitter. Have been in business. Can furnish satisfactory references. Address, "T. B." THE SANITARY NEWS.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED—AT ONCE—TEN FIRST-CLASS responsible salesmen who thoroughly understand the plumbing, steam-heating, gas-fitting, and machine supply business, to sell to the jobbing and small trade. WESTERN MERCANTILE CO., C. N. HOOPER, Manager, Dubuque, Iowa.

WANTED.—TWO GOOD TRAVELING MEN in our line for the territory tributary to Chicago and the West. State experience, age, and give references. L. WOLF MFG. CO., Chicago.

WANTED.—A MAN ABOUT 30 YEARS OF age who has been accustomed to working specialties with Architects. Address J., care of THE SANITARY NEWS.

WANTED.—A GOOD PLUMBER, GAS AND steam fitter. Married man preferred. Must be sober and reliable. Steady employment. Wages $18.00 per week. Address H. C., care THE SANITARY NEWS.

PLUMBERS' CARDS.

*DAVID WHITEFORD, PRACTICAL PLUM*ber and Gas-fitter. Sanitary plumbing a specialty. 372 W. Randolph Street, Chicago, Ill.

P. HARVEY, SCIENTIFIC AND PRACTICAL Plumber, 540 Thirty-Ninth Street, between Michigan and Indiana Avenues, Chicago. Residence, 3629 Dearborn Street.

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FOR SALE.—A PROSPEROUS PLUMBING business, located in one of the best cities of the Ohio valley. Reasons for selling. Full particulars. Address GAS, care THE SANITARY NEWS.

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HENRY ROBERT ALLEN, MEM. SAN. INST. Surveyor, 50 Finsbury Square, and 319 Victoria Park Road, South Hackney, E. London inspects houses and furnishes reports of their sanitary condition. Terms moderate. References, London agent for THE SANITARY NEWS, published at 88 and 90 La Salle street, Chicago, Ill., U. S. A. Money orders and checks should be made payable to THE SANITARY NEWS.

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Mem. Am. Soc. C. E., M. Inst. C. E.
Civil and Sanitary Engineer
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Designs for Water Supply and Sewerage. Construction Superintended.

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Consulting Engineer for Sanitary and Agricultural Drainage and Municipal Work.
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Plans for, and Supervision of Construction of Sewerage, Sewage Disposal, Drainage, Plumbing, Water-works, etc.; also
Topographical Work and the Laying out of Towns.

SAML. G. ARTINGSTALL, CIVIL ENGINEER. Plans and estimates for Water Supply, Sewerage, Bridges and Municipal Works. 28 Rialto Building, Chicago.

WM. PAUL GERHARD, CIVIL ENGINEER, author of "House Drainage and Sanitary Plumbing," "Guide to Sanitary House Inspection," etc., offers advice and superintendence in works of sewerage, water supply, ventilation, and sanitation. Sanitary arrangement of Plumbing a Specialty. Work in Chicago and the West particularly desired. Correspondence solicited. 39 Union Square, West, New York City.

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Makes a specialty of Plumbers' Claims and the Mechanics lien law.
LA FAYETTE BUILDING,
Suite 42, 68-74 La Salle Street, CHICAGO.

SEALED PROPOSALS.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 1st day of May, 1891, for furnishing all the labor and materials required to put in place complete, the system of plumbing for the U. S. Court House, Post Office, etc., building at CLARKSBURGH, WEST VIRGINIA, including the finishing of the four rooms in attic, in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Custodian of Clarksburgh, W. Va. Each bid must be accompanied by a certified check for $100.00. The Department will reject all bids received after the time herein stated for opening the same; also bids which do not comply strictly with all the requirements of this invitation. Bids must be enclosed in an envelope, sealed and marked "PROPOSAL for the Completion of Plumbing, Attic Rooms, etc., for the U. S. Court House and Post Office, etc., Building at Clarksburgh, West Virginia," and addressed to

JAS. H. WINDRIM,
April 3, 1891. Supervising Architect.

Particular Attention to Plumbers!

THOMAS BURTON & CO.,
CITY NIGHT SCAVENGERS
Particular attention given to Cleaning Out Privy Vaults and Catch Basins,
Office, 76 FIFTH AVENUE, - - - CHICAGO.
Telephone 1880.

BUILDING PERMITS.

Albert Ehlhorst, 2 2-sty and bst brk flts and barn, 24x20, 397 N. Leavitt st	$6,000
F. H. Schan, 4 sty and bst brk flts and barn, 22x25, 58 W. Huron st; a, H. Rasmussen	11,500
Mrs. A. M. Lundgren, 3-sty and cel brk flts, 20x80, 346 Belden ave; a, Ostling Bros	14,000
C. W. Seneco, 3-sty and cel brk flts, 24x50, 358 Belden ave; a, Treat & Foltz	8,000
A. J. Aubery, 3-sty and bst brk flts, 22x47, 159 38th st; a, A. J. Aubery	6,000
N. C. Ritchie & Co., 6-sty and bst brk fcty, 117x150, Van Buren and Green sts; a, T. C. Tarbell	60,000
Chas. Halzpfel, 3 sty and cel brk str and flts, 24x70, 558 W. Division st; a, G. Bloedner & Co	6,000
Jos. Pinz, 3-sty and bst brk flts, 21x65, 29 W. Union ave	5,800
H. W. Hilmes, 3-sty and cel brk flts, 25x70, 749 Hinman	6,000
Andrew E. Seicht, 2-sty and bst brk dwllg, 30x70, Fullerton ave and Clark st; a, A. Feidler	35,000
F. Madlener, 2-sty and bst brk dwllg, 30x65, Fullerton ave nr Clark st; a, A. Feidler	30,000
Hugh Hughes, 3 3-sty and bst brk flts 71x46, 127 129 S. California ave; a, H. T. Parks	21,000
O. W. Potter, 2-sty and attic brk dwllg, 38x75, 130 Lake Shore Drive; a, T. R. Schock	50,000
B. Friend, 4 sty and cel brk str and flts, 28x44, 61-63 Chicago ave; a, Kley & Lang	6,500
A. Finkl, 2-sty and bst brk flts, 22x84, 198 Willow st; a, H. P. Bieler	6,000
Wm. F. Thomas, 4-sty and cel brk flts, 33x60, 1927 Calumet st; a, F. Fry	12,000
N. D. Ewart, 3 and 1 addl stys, 60x180, 11-31 S. Jefferson; a, J. H. Wagener	25,000
Herman Stock, 4-sty and bst brk str and flts, 25x70, 419 W. Chicago ave; a, Freys & Bartlett	7,000
P. J. Cahill, 2-sty and bst brk flts, 24x60, 980 Warren ave	5,500
John W. Bohn, 4 sty and cel brk str and flts, 26x100, 160 Gault pl; a, Bettinhofer & Herman	15,000
Geo. F. Gerst, 1-sty brk storage and brn, 120x125, 501-511 31st st; a, Orr Bros	12,000
W. J. Hellwig, 2-sty and bst brk str and flt, 24x60, 419 S. California ave; a, A. Kaiser	5,500
Mrs. Mary Cullum, 3-sty and bst brk flts, 26x56, 15 S. California ave; a, Bloedner & Co	6,000
Robert Jahneke, 3-sty and cel brk flts, 24x108, 27 Dean st; a, Wm. Ohlhaber	7,000
Joseph Casagrande, 3 sty and bst brk str and flts, 22x122, 39 E. Chicago ave; a, Hetherington & Warner	14,000
W. Alward, 3 2-sty brk flts 63x42, 234-36 Hoyne ave; a, Randall & Miller	10,000
G. C. Forest, 4-sty and bst brk strs & flts, 20x80, 172 W Indiana st; a, G. O'Hanson	7,500
Barry Bros., 5 3 & 2-sty and bst brk dwlgs, 100 x74, 4050-58 Grand bld; a, O. N. Marble	75,000
Mrs. D. Ensign, 2 sty and cel frm dwllg, 22x48, 6100 Woodlawn ave; a, C. H. Tabor	5,000
I. N. Darling, 2-sty and cel brk flts, 20x60, 4627 Langley ave	5,700
Chas. Massey, 3-sty and bst brk strs and flts, 25x70, 9224 Commercial ave	6,000
H. W. Winkelman, 3-sty and bst brk flts, 25x66, 1730 Oakdale ave; a, L. Brodhay	5,000
Moorehouse & Zeitler, 2 2-sty and cel brk flts 44x52, La Fayette ave	8,000
Jacob Weil, 9 3-sty and 3 4-sty and cel brk strs and flts, 216x72 and 60x60, 4780-4752 State st; a, Jacob Weil	60,000
F. Grossman, 3 sty and cel brk strs and flts, 50x80, 5608-5610 State st; a, E. R. Crouse	20,000
L. M. Beck, 2-sty frm flts, 305x14, Wright st near 68th st	13,000
Conrad Taige, 3 4-sty and bst brk strs and flts, 75x85, 6236-30 S. Halsted st; a, Fred Ahlschlager	28,000

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Wolff's Patent Needle Baths.

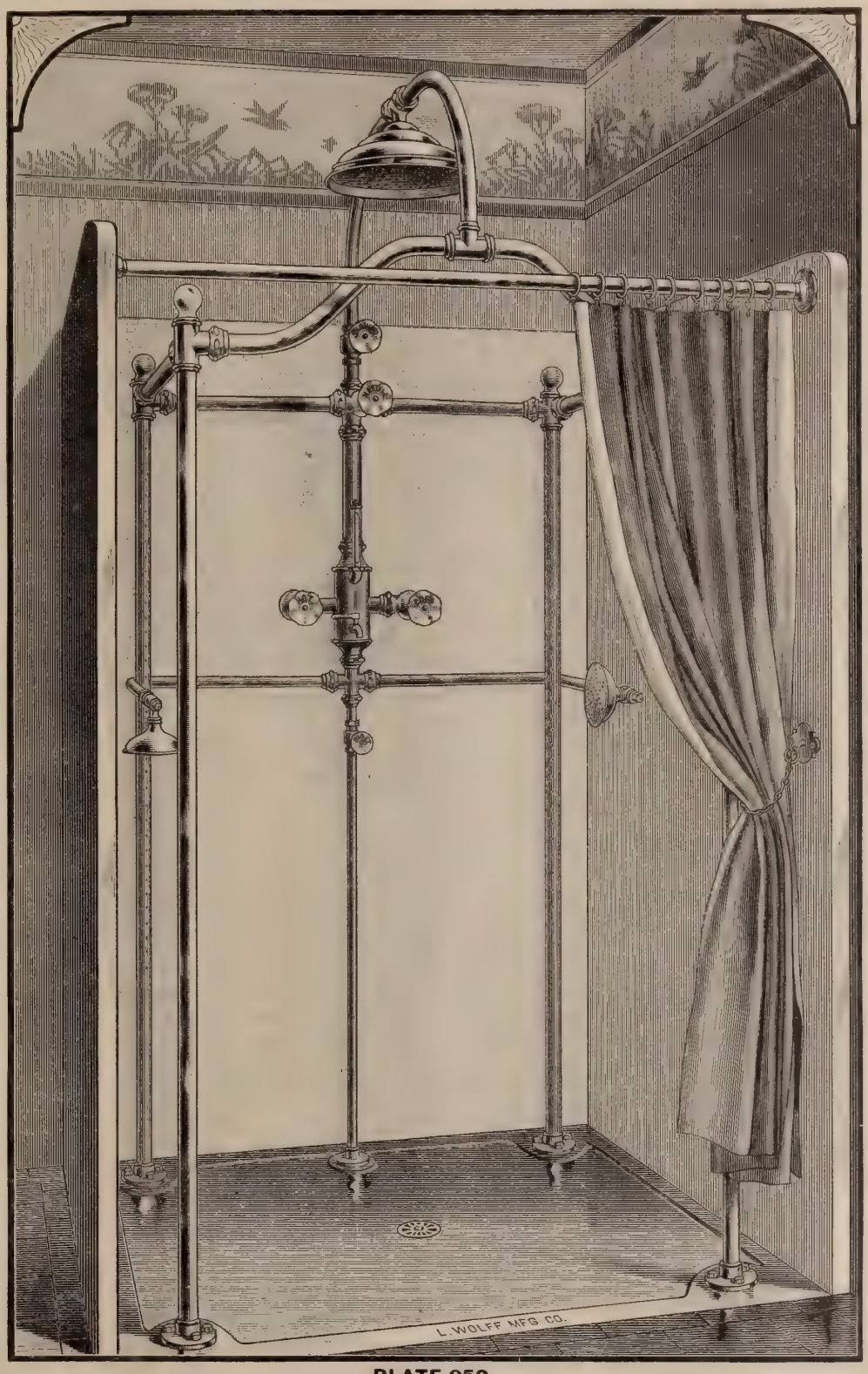

PLATE 952.

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are in use in all parts of the United States and have gained a high standard of merit on account of their simplicity and cleanliness.

All our sanitary appliances may be seen in operation at our show rooms.

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Non-Syphon Sewer Gas Trap

IS THE BEST AND CHEAPEST.

BECAUSE—It is a drum trap, so proportioned as to make it self-cleaning.

BECAUSE—It is non-syphoning, unvented.

BECAUSE—When vented the vent is taken out above the water level making it almost impossible for it to get stopped up.

BECAUSE—It has a large trap screw, making it easily accessible.

We are giving the trade a scientific trap at a low price.

If you use it once you will use it always.

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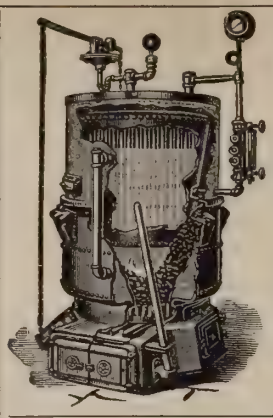

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The position of the coal pockets is such that the reservoir can be as easily filled as an ordinary kitchen range. Hundreds in use, giving entire satisfaction. Our new book on Modern House-Heating, furnished on application.

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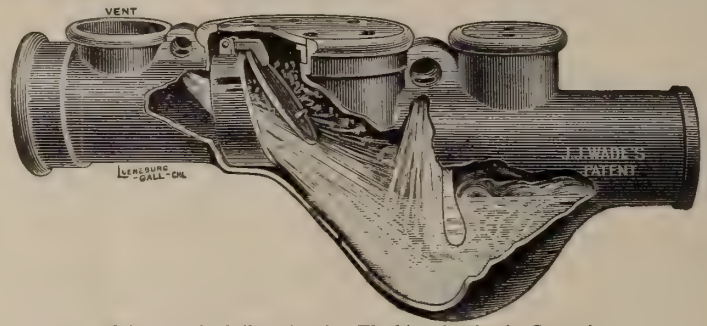
96 Liberty St., NEW YORK. 197-203 Congress St., BOSTON.



Main Trap in Cellar, showing Flushing Device in Operation.

THE WADE PATENT FLUSHING FITTINGS

Are made of extra heavy Iron, and are capable of resisting 250 lbs. pressure. The Cover is perfectly tight, being screwed against gasket, but may be easily removed.

The particular advantages derived from the use of these fittings are that the owner may at any time inspect the condition of his sewers; when flushing becomes necessary a hose can be attached, and the cleansing performed in this easy manner, or they may be connected direct with the Main Water Supply. They are made to be used with either Clay or Iron Pipes.

The Fittingsare so constructed that a Back-Water Gate may be attached, thus preventing the flooding of Cellar. They are an infallible protection against Sewer Gas.

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Address all communications to The Sanitary News, 90 La Salle Street.

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They who consider plumbing simply as a trade, the application of mechanical skill, are about fifty years behind the times. In fifty years plumbing has stepped clean across a century. In a decade it has added fifty years of progress to one of the most important trades in building construction. It has long since passed from the merely mechanical to the scientific, and it now embraces both the art of applied skill and the profession of scientific sanitation. No one understands this more than the plumbers themselves, to whom is due this marvelous advancement. Their constant efforts have wrought an improvement that has not been equaled in any other department of industry. Yet when a law is to be enacted or an ordiance passed, we find those who oppose it, assuming to believe that all enactments are for the sole benefit of the plumber and not necessary to enforce the methods which science has demonstrated to be necessary. Bills are defeated, which, while they regulate plumbing, have a strict regard to the highest welfare of the public, and are demanded by the highest interests of mankind. All this, or the most of it, results from the opinion regarding plumbing as merely a mechanical trade. The difference between a blacksmith and a plumber is not considered, and the latter is looked upon about as the former, both mechanics. The scientific principles that underlie plumbing, and the scientific knowledge required by the plumber, are not taken into account. It is this we wish to impress upon the public, that the plumber may be given the consideration his importance demands.

The convention of the American Water Works Association, held at Philadelphia last week, was a representative body of the vast interests it represents. The interest manifested and the labor performed evidence the earnestness of purpose this association has in the marvelous progress it is making. It now represents not only one of mankind's greatest necessities, but one of our most important, useful, and progressive industries. It is continually adding its proportion of energy and activity to the necessities of a great and rapidly growing country. It is making possible the collection of mankind into great industrial, manufacturing and commercial centers. It is essential not only to the life of trade, but to that of humankind.

When one contemplates its present advanced state, it would seem that it had reached the limit of possibilities. Research and invention, industry and skill would seem to have exhausted themselves in bringing the machinery used in this great branch of enterprise to the perfection it has attained. Interests have largely centered in supplying pipes of best quality, in constructing reservoirs, making pumps, engines, etc., until it now seems that perfection has been so nearly attained that invention could retire or turn its attention to other fields. One thing is certain: Water can be supplied to any city in any quantity. Engineering skill is adequate for any problem that may be presented, and manufacture has fully demonstrated its ability to produce any machinery required. But there is another field to which all these interests may properly be directed. We know that water in plenty can be furnished. Attention can now be directed more immediately to the procurement of pure water. We can now devote these energies to the quality of water that is to be supplied with the same vigor they have been devoted to the supply of quantity. Much progress has already been made in this direction, yet here lies a field in which inventive genius may well become inspired with the possibilities before it. The increasing population of the country is not only polluting the streams on which reliance for supply is so largely based, but the capacity of these sources is being diminished. Cities are continually springing up along these streams polluting the water and the soil. The coming problem in water supply will be its purification or the source of supply. Sewage disposal enters largely as a factor in the first, and the possibilities of the lower under-ground waters is as yet an almost unknown quantity in the latter.

THE INSPECTION DEPARTMENT.

The Sanitary News has nothing to do with politics. That is not its trade. Its business is to advocate that which pertains to the health and happiness of the people, and to assist in the securement of the means to this great end. But where politics affects these means it must be considered as a means. The in-

coming administration of our city government will naturally be attended with the appointment of many new officials. It is but reasonable to expect that Mayor Washburne will desire that the appointments which fall to his office shall be of his own selection. Yet this does not necessarily mean that the appointees shall be new and untried men. We believe the mayor elect will respect his pledges. It is not to be supposed that he made them for campaign purposes. We believe he made them conscientiously with a determination to fulfill them if elected. There is one department in which The Sanitary News is deeply interested and in which it would like to see no change. That is the department of tenement house and factory inspection. The editor of this paper has watched this department through three administrations very closely. It has advocated the methods now adopted, and fought for the appointment of practical men for inspectors. In the present corps there are ten practical plumbers, and, as plumbing is the main feature in this service, it stands to reason that they have the desired qualifications for inspectors. Moreover they have had two years of experience and training under a chief who is also a practical plumber well versed in general sanitation. These inspectors are acquainted with all the firms doing work in the city; they know their methods and practices, and know whom to watch in the enforcement of the sanitary code. They are in the harness and in perfect working order. Their work is deserving of the highest commendation, and no one who has made himself acquainted with this important service could advocate a change in the best interests of this department and public welfare.

This department has accomplished more and better work in the last two years than it has ever before. It is not saying too much to say that it is the first time in its history that it has been effective and efficient in a service so important and valuable. It is now at that stage where a change could prove disastrous, and when it would be impossible to improve it with the exception of increasing the force. This should be done. These remarks apply to the inspectors throughout the force including the five lady inspectors whose services entitle them to the consideration and commendation of all. It is not a part of good government or good politics to disturb such an efficient department, and we can not believe that the incoming mayor will menace the efficiency of this department by relieving the faithful and effective force of inspectors now employed.

In regard to the Chief Inspector we need say nothing. The Sanitary News did its part in securing his appointment and is glad to accept its share of the responsibility for his selection. All we wish now to ask of the mayor elect is that he investigate this department before he makes any change. Its work speaks for itself, and besides there are many who can speak for it. We know the pressure for place in the change of administrations, and the new mayor will be pressed for places on all sides; yet he who serves the public well serves himself and friends best. Preferment comes by public sanction, and a public well served is well satisfied and ready to reward its faithful servants. The man who can take the mayor's chair and keep the most politics out of the city government, will take the most power and support with him. Everything in the last election goes to show that the partisan is not the people's choice, and the present is a favorable time to begin to recognize fitness regardless of party favoriteism. We trust this department will receive the mayor's most considerate investigation before any changes are made.

THE APPRENTICE.

It is not the intention to discuss the apprenticeship question, but the apprentice. We are in receipt of a letter from an apprentice seeking information and advice. He writes that he has an ambition to organize apprentice unions similar to the journeymen's unions, and asks our opinion of the matter. The letter is anonymous, and would receive no attention were it not for the earnestness manifested and the undoubted sincerity of the writer in his endeavor to better the condition of the apprentice and to increase his usefulness.

In regard to the organization of any or all unions, their usefulness depends entirely upon the manner in which the unions are conducted, their object, and the direction given them. They can be made of great value and aid to their members and to employers as well, or they can become a positive injury to both. There is one source of weakness regarding them, which, when present, always works evil. That is the reliance placed in the unions to the exclusion of personal effort. There is a belief among many that a union is all that is required. That it alone will work out the temporal salvation of its members, and that the individual and his own personal endeavors are merged in the union and that is all that is necessary. It to a serious degree takes away the sense of personal responsibility, and the union becomes not only the guardian of the members, but their counselor, advocate, arbiter and all. They consider that their personal obligations and individual efforts end when the union begins; and it is this shifting of reliance on self to that of the union that works injury, disappointment and dissatisfaction. The union is supposed to correct all evils, secure good wages and do for the individual that which he should do for himself. No union can do this, and when it fails the failure is not attributed to a lack of personal effort or the ineffectiveness of the union, but to something wrong in the relations of employer and employe. Where this feature is not present it of course does not work the evils indicated and, with personal obligation and individual effort placed upon each member, the union may be directed greatly to the benefit of all.

In replying further to our apprentice friend, we would state that a union of the kind he speaks of could be made very profitable. If an organization be formed the object of which is to advance the interests of the apprentice in acquiring his trade, to aid him in gaining information and skill, to assist him in becoming proficient in all the branches of the important calling he has chosen, then it would be at once a success and an important feature in the means of acquiring those qualifications necessary to make the proficient plumber, An organization of any kind is helpful so long as it is directive to greater individual effort, a stimulus to healthy emulation, and an inspiration to sobriety, honesty, faithfulness, industry and all the qualities which go to make up the perfect man as well as the proficient workman. If such an organization be relied upon to take the place of personal responsibility and individual effort, it will prove a failure and a disappointment. It will be worse than no organization, as it will fail in its intended mission, and the members in looking for the cause of failure will ascribe it to industrial conditions, failing to recognize the lack of his own efforts.

The apprentice is a student. He is in a school to be taught. Opportunities are given him to perfect his education, and his time and energies and talents should be sacredly devoted to that end for his own good. He must work for himself. He must gain knowledge by hard work and close application. It cannot be given him, and he will find that he will be helped the most when he most helps himself. It is thus in every human endeavor. Fred Douglas says that he longed and prayed for fredom, but never got it till he prayed with his legs. So it is; neither Providence nor man can help one who does not help himself. Every attainment is reached through properly directed individual effort. There are aids and they will be given to the worthy and industrious freely. It is the common experience that worthiness is always rewarded, and that indolence and recklessness are rebuked. Fortune is not rushing around looking up vagabonds on whom to bestow her smiles. She must be sought out and tirelessly wooed. Associations cannot do this only in so far as they may aid individual effort—in so far as they may inspire the acquirement of all the qualifications that go to make up the upright man and the efficient toiler in whatever pursuit he has chosen. The apprentice may find valuable aid in organization, but for the perfection of himself, the acquirement of his trade, he must rely on his own constant, presevering efforts.

SPRING CLEANING.

The time for the annual or semiannual house cleaning has arrived. All good housewives are preparing to give their homes a good overhauling and renovating. The old mode of using the dust brush and water is antiquated, and more hygienic methods are now employed. House cleaning, in order that it may be effective and meet the sanitary requirements of a healthful home, should also embrace a thorough, systematic inspection. Dust accumulations, smoke and soot are of course to be removed, but the work

should go deeper than this and it should be done in a correct manner. An exchange gives the following regarding house cleaning which will suggest other things the housekeeper will find beneficial to regard:

"All dust-laden places should be wiped with a slightly dampened, or oiled cloth, so as to pick up rather than displace the dust. Dust brushes are worse than useless, for they only set the dust to floating, to be lodged somewhere else. Walls and ceilings could be rubbed with stale bread, which not only restores the brightness of the papered walls, but picks up all the dust. It is hardly necessary to say, that the cleansing process should begin with the ceilings and the work proceed from thence downward. The floor should be sprinkled with a thin layer of saw dust, dampened with a solution of carbolic acid. A good plan is to have a large box or barrel of saw dust. Twenty-five cents worth of carbolic acid, in a gallon of water, would be sufficient to serve for the entire cleaning of a large house. The bread crumbs, dust, saw dust and cloths used for wiping the wood work, should finally be swept up carefully and burned. During the sweeping and dusting, the windows and doors, as far as practicable, should be opened wide, not only for the purpose of driving out floating particles of dust, but for the better purpose of disinfection. Fresh air is a wonderful as well as cheap disinfectant."

There is another valuable agent that can be employed in this renovation. That is sunshine. If you are afraid it will fade your carpets or upholstery, cover them up slightly and let the rays of the sun penetrate all portions of the house possible. This of course should be done every day, but it is important just after a regular washing and cleaning up. It not only removes dampness, but sunlight has a wonderful disinfecting power. There is health in every sunbeam and it is carried wherever a beam is allowed to fall. Do not shut it out. Mould, fungi, or parasites cannot exist where the sunlight is allowed to bring its sweetness and balm.

Be careful to note that every means of ventilation is in good order and perfectly clean and pure. If there be shafts or ducts, note them carefully and keep them disinfected. There are probably some means of ventilation that have been closed during the winter which will be required during warmer wether. Open them up and see that they are made fit for service. These are important items and should not be neglected.

If there is plumbing in the house, see that it is inspected and all needed repairs thoroughly attended to. Do not undertake to do this yourself, for you do not know anything about it. You could not determine whether the plumbing was defective or not. Get a good practical plumber to do this for you. It will not cost much, and then you will have it done right, and it is worth a good deal to have that satisfaction. Remember the most important part of house construction is the plumbing. Neglect it, and you neglect the first principles of the most important health conditions about the home. Go on the principle that it pays to do everything right, and have a plumber to set your house in order as regards plumbing, and you will have the comfort of a security you can gain in no other way.

PURE WATER AND ICE.

Sanitary authorities should not forget to repeat the warning—needed quite as often by the medical practitioner as by the layman—that chemical analysis alone cannot determine the fact that a given specimen of water is pure, and free from elements dangerous to health and life. The chemist may inform us of the amount of chlorides, of free and albuminoid ammonia which waters may contain, and that, when above a certain proportion, such waters are not potable; but water may be found acceptable by such analysis and yet charged with elements of great danger to the human animal. Bacterial life of very potential quality may not appear in the columns of results determined from the chemist's crucible.

Biological examination of suspected waters is quite as important as chemical analysis, and, in some instances, of far greater value in determining its character. The chemist must be a microscopist, and an able one, and he must make use of both methods of interrogation before we can accept his approval of examined waters.

This thought regarding pure water prompts a suggestion on the ice question. Many communities are receiving ice for domestic use taken from ponds or rivers, the waters of which would never be used for household purposes. Freezing does not purify water, it does not destroy germ life, and there are the same reasons for rejecting the ice as for rejecting the water. Artificial ice from distilled water is to be the ice of the future for family use, and happily it can be produced far below the cost of the natural product.

An exchange says: "It has been satisfactorily established that where fuel is reasonably plentiful it is cheaper to manufacture ice than to bring it from any distance. With coal at $3.50 per ton it has been found possible to make ice for less than $2 per ton including a liberal allowance for the wear and tear of the plant and the interest on capital employed." Preference should always be given to the manufactured ice when it can be had, and in every considerable community it can be had by demanding it.

Last summer some of the natural ice dealers in this city attempted to scare their patrons from the use of the manufactured article by a lucid explanation of various chemicals that were mixed with the water to freeze it. Such libel and fraud can not long affect the ignorant even, for refrigerating machinery and ice making plants are as surely within the comprehension of the average intelligence as is the use of the pump handle surrounded by milk cows.

NOTES AND NEWS.

One day, in 1830, says *Invention* when a working jeweller, Joseph Gillott, now the famous steel pen maker, accidentally split one of his fine steel tools, and being suddenly required to sign a receipt, not finding his quill pen at hand, he used the split tool as a ready substitute. This happy accident led to the idea of making pens of steel.

There are moments in the life of an oyster when to eat him is simply suicidal. It is pretty generally known that the oyster is an unclean feeder, and devours sewage; but if he has once digested this unsavory dainty he may then be eaten with impunity. If, however, he is captured when in the act of sucking in the impure matter he carries typhoid into the blood of anyone who may afterwards swallow him.

An "inch of rain" means a gallon of water spread over a surface of nearly two square feet, or a fall of about 200 tons to an acre of ground.

The Duke of Edinburgh has consented to act as vice-president to the Prince of Wales at the forthcoming International Congress of Hygiene, to be held in London in August next.

Spring cleaning time is at hand and it may be that some of the local boards of health as well as individuals may require to be reminded that the hot weather is a bad time to disturb accumulations of winter refuse or filth, and such should be invariably removed and disposed of before the very warm season commences. It is now high time that preparations were everywhere being made for "cleaning up," and also for the most thorough work in this behalf. In nothing is routine, perfunctory or incomplete work so objectionable or so bad as in sanitation.

Add carbon to pure iron and it becomes steel. Add a hydrocarbon to iron, and steel itself becomes so extensively modified that its properties are not recognizable. Thus steel may be as soft as pure iron. Add hydrogen, in varying quantity, and it has the quality of resilience, as in the watch spring, or the quality of tenacity, as in the knife or razor, or may be given nearly the hardness of a diamond, as in a file. With steel at a low temperature, from 400 to 450 deg. F., edge tools are produced, the color in the yellow shades; from 500 to 525 deg. various sorts of springs are produced, color blue; while by heating iron to whiteness and plunging it into water, which is mainly composed of hydrogen, files are produced or forms even harder.

"It is no new doctrine," says the *Lancet*, "that in the presence of infectious or contagious disease every object may become endowed with a mischievous faculty of transmission. Nothing is exempt, though some substances are naturally better fitted to act as media than others. Such substances as clothing and carpets may be placed in the first rank, and paper, especially in the book form, hardly second. The scrupulous rigor with which measures of purification are adopted in regard to all these, is proof of the wholesome suspicion with which they are commonly invested. It was not to be expected that paper money could escape the stigma,

nor should it. Even solid coin has latterly been credited with the same maleficent property. It cannot be denied, indeed, that any penny or shilling may thus be made to bear a novel and mischievous increment of its own."

In some cases, it becomes impossible to locate a furnace to supply warm air to all the flues built in the house. This difficulty could be overcome if all the details of location of furnace, length, size and shape of air pipes and flues, size and position of smoke flue, position and size of cold air duct, were caretully studied, and included in plans and specifications.

The importance of a good kitchen can hardly be exaggerated. It is the great laboratory of the household, and it ought to be remembered that not only the comfort, but the health of the family also is greatly dependent upon the manner in which food is prepared. A kitchen should be proportioned to the size of the house, reasonably large, with good height of ceiling, well lighted, and properly ventilated.

In an economic and sanitary sense the best methods of utilising fuel, and the science of abating the nuisance of its smoke, are questions of immediate and increasing importance. As a rule, and that with but few exceptions, the homes of the majority of our population, and the accessories consequent in civilization and comfort to the vitalities of our industrial life, are grouped in the centres, where the use of fuel is more abundant and the nuisance of smoke the most intolerable.

MEETINGS OF MEDICAL ASSOCIATIONS.

The *Medical Age* publishes the following times and places for holding meetings, the names of secretaries being given as for as known.

American Medical Association, Washington May 5th, W. B. Atkinson, Philadelphia,

Colorado, Denver, June 16th, C. Parkhill, Denver.

Connecticut, Hartford, May 27th, M. E. Worden, Bridgeport.

Dakota, N., Fargo, May 26th, Dr. Rounseville, Larimore.

Dakota, S., Chamberlain, June 10th, A. C. Warne, Mitchell.

Delaware, Rehoboth, June 9th, W. C. Pierce, Wilmington.

Illinois, Springfield, May 19th, D. W. Graham, Chicago.

Indiana, Indianapolis, May 18th, E. S. Elder, Indianapolis.

Kansas, Wichita, May 13th, Dr. Lindsay, McPherson.

Kentucky, Lexington, May, J. Steele Bailey, Stanford.

Maine, Portland, June 9th, C. O. Smith, Portland.

Maryland, Baltimore, April 28th, Lane Taneyhill, Baltimore.

Massachusetts, Boston, June 9th.

Michigan, Saginaw, June 11th, C. W. Hitchcock, Detroit.

Minnesota, Minneapolis, June 18th, C. B. Witherle, St. Paul.

Missouri, Excel. Springs, May 12th, J. C. Mulhall, St. Louis.

New Hampshire, Concord, June 15th, G. P. Conn, Concord.

New Jersey, Long Branch, June 23d, W. Pierson, Orange.

New York Association, New York, October 28, E. D. Ferguson, Troy.

North Carolina, Asheville, May 26th, J. M. Hays, Oxford.

Ohio, Put-in-Bay, June 9th, G. H. Collamore, Toledo.

Pennsylvania, Reading, June 2d, W. B. Atkinson, Philadelphia.

Rhode Island, Providence, June 11th, W. R. White, Providence.

Texas, Waco, April 28, F. E. Daniels, Austin.

Vermont, Burlington, October 15th, D. C. Hawley, Burlington.

Washington, Seattle, May 6th, C. L. Flannigan, Olympia.

West Virginia, Fairmont, May 20th, J. L. Fullerton, Wheeling.

Wisconsin, Madison, June 3d, J. R. McDill, Milwaukee.

New York State Society held its meeting for 1891, in February, hence does not appear on the list; the secretary, however, is Dr. F. C. Curtis of Albany.

The Nebraska Meeting is to be held in Lincoln, but the date has not been announced; Secretary, Dr. W. J. Hildreth, of Lyons.

The Secretary of the Virginia State Society is Dr. Langdon B. Edwards, the erudite editor of the Medical Monthly, residing at Richmond. Lynchburg is the next place of meeting, but the date remains to be announced.

We have been unable to obtain the names of the Secretary of the South Carolina and the time and place of meeting has not been announced.

Dr. P. B. McCutcheon, of New Orleans, is Secretary of the Louisiana Society, but the date and place it is not customary to announce until a short time before the meeting.

THE DES MOINES, IOWA, MASTER PLUMBERS' ASSOCIATION.

The Master Plumbers' Association of Des Moines, was first organized in 1884, the charter members being A. H. Walker & Co., Burnside & Kehoe, Collis & Cawley, Fowler & Nepil, Warner & Carruthers, Cooper & Laing, Collins & Son, and J. E. Allen. Officers, Jas. Laing, President; J. Carruthers, Secretary; and A. H. Walker, Treasurer.

In 1886 C. W. Fowler was elected President, there being no change in other offices.

In 1884 J. E. Allen was elected delegate to represent the Association at the National Meeting in Washington, D. C., and J. Carruthers in 1885 at St. Louis.

At this time the association was in a good condition, and prospering; but in 1887, owing to dissatisfaction among the members regarding distribution of percentage and cutting of prices, it was virtually disbanded.

In 1889 it was reorganized with A. H. Walker & Co., Burnside & Kehoe, Jno. Collis, C. W. Fowler, Laing & Scoville, J. E. Allen, Wallace & McNamara, Ryan & Flynn, and F. E. Wilson as members, with Jas. Laing as President, C. W. Fowler, Secretary, and J. Burnside, Treasurer.

The Association was represented at the eighth annual meeting at Denver by Jas. Laing and J. Burnside. At this time it was in a most flourishing condition and good working order, with about $1,000 on hand, but the same troubles arising in 1887 has practically suspended all operations and though the association is not broken up, yet no regular meeting has been held for the last six months. The old members are still as enthusiastic as ever and contemplate representing Des Moines at the State Convention which will be held in Sioux City, May 1, 1891.

There are no actual laws in force in this city regarding plumbing; neither has the Board of Health or Public Works any power to restrict. The sureties required by the city are a bond of $4,000, and a yearly license fee of $25, with a regular charge of 25c for permits to open street. The Des Moines Water Co. also require a bond of $2,000. The Board of Public Works for the city at present consists of R. T. Finkbine and E. C. Chase, and the Board of Health of Dr. Kennedy and L. F. Andrews.

JAMES LAING.

James Laing, the present President of the Association was born in the year 1835 in Aberdeen, Scotland. He served his time as apprentice to a country blacksmith, and after that went to the city proper and worked at his trade in the shipbuilding yards of John Duthy & Co. The year 1860 found him in London, England, and in 1861 he went into the naval dockyard at Chatham as angle iron worker and worked for her Majesty for nine years, and still has his certificate of discharge and recommendation of good character and workmanship, signed by the Right Hon. Lord Hamilton, first Lord of the Admiralty at that time.

In 1870 he emigrated to Des Moines and worked as machine

blacksmith for Loughran & Hillis. In 1871 bought into the blacksmith shop owned by M. Atkins. He sold out in 1873 and was employed by the Des Moines Scale Works until 1875. He then started a "Novelty" Repairing Works, repairing almost everything that was in daily use, and so gradually got into the plumbing, steam and gasfitting business. At this time he made the first iron steamer in use on the Des Moines River, and brother Agnew, of the Crane Manufacturing Company, and brother James, formerly with W. and B. Douglas, have good cause to remember a Sunday excursion on the "Scotia."

In 1880 he became a full-fledged disciple of the art of plumbing, and has been engaged in the business since then. Until last December he was the senior member of Laing & Scoville; but owing to troubles of both a private and business character, he has had the affairs placed in the hands of a receiver and is now for himself alone.

He lost his wife, Mrs. Eliza Laing, in 1887, by whom he had no issue.

A thorough master of his craft, and a jolly good fellow as all who know "Jimmy" will testify, but withal he is a poor business man in which respect he is his greatest enemy.

ARTESIAN WATER SUPPLY.

A new feature in the water supply from artesian wells has been successfully introduced at New Orleans, and promises to be of much value in the increase of flow from these wells. The New Orleans *Picayune* describes the method there employed as follows:

Many of the more extensive manufactories in the city where large quantities of water are necessary, says The New Orleans *Picayune*, have resorted to the use of artesian wells, and while the supply furnished has in most cases proved adequate and the water satisfactory to taste and smell, in some instances larger quantities than could be supplied by the driven wells were wanted

To increase the flow of water has been sometimes difficult, if not altogether impossible, but the question has been at last solved in a satisfactory manner, and a flow of water, from a single well, of 1,000,000 gallons in twenty-four hours is an accomplished fact.

Among the fallacies regarding artesian water in this city was one that it could not be used for the manufacture of ice. This was disproven by the management of the Crescent City Ice Manufacturing Company, who used it for that purpose from the first.

Two artesian wells, 740 feet deep each, were driven in the yard of the factory on Front, between Lafayette and Poydras streets, the first furnishing water at the rate of 60 gallons per minute, and the other 80 gallons. Recently the company added a new 30-ton ice machine to its plant, and a larger supply of water was necessary. A third driven well was determined upon, but even with this addition, should it flow at the rate of 80 gallons per minute, it would not prove sufficient for their purposes.

S. J. Whitesides, of Savannah, Ga., who is vice-president of the New Orleans company, determined to venture on an experiment to increase the flow of water, and that he was successful can be demonstrated by a visit to the company's works, where the flow of water will astonish all. Instead of an outpour of 80 gallons per minute at the surface of the ground he has secured an unremitting flow of 700 gallons per minute three feet above the surface, and the water is pure, clear and sparkling, for it is slightly impregnated with carbonic acid gas and is devoid of taste.

Mr. Whitesides found in Savannah, Ga., that by cutting off the pipe twenty feet below the surface and attaching to the end a pump, the flow of water greatly increased. He concluded to try the experiment here, and about a month ago the pipe (one inch in diameter), having been driven down 740 feet and a flow of 80 gallons per minute having been obtained, he set to work. First he stopped the flow and commenced digging a well about 35 feet in circumference around the pipe. He dug down 20 feet and secured the sides with a brick wall. A pump with a cylinder 18 by 24 inches, with a plunger 20 feet long, was placed upright in the bottom of the well, and at the surface a steam cylinder 18 inches by 34 inches was placed vertically and connected with the boilers inside the building. A 6-inch discharge pipe was connected with the pump, and all was ready.

Again the knowing ones were disappointed. They had told Mr. Whitesides that if he stopped the flow of water from the draw pipe, a sediment would form in it and choke the flow of water. The pipe had been closed a month, yet when it was opened and the pump set to work, the flow was not only as great but nearly ten times greater than it was at first. The 6-inch discharge pipe appeared to be almost too small to allow the column of water which jutted forth to escape and the gutters in the streets were soon overflowing. For four hours steadily the water flowed, and there was no apparent diminution in the supply, nor yet were the two other driven wells not twenty feet distant effected by the discharge of the immense quantities of water.

Mr. Whitesides says by this means a supply of 1,000,000 gallons every twenty-four hours is attainable, while by lowering the pump to a still greater depth the supply would be still larger and could readily be increased to 2,000,000 gallons in twenty-four hours.

HEATING BY HOT WATER.

In a catalogue issued by Rubel & Company, of Chicago, the following article on hot-water heating appears:

Hot water has come rapidly into favor in this country during the past few years, and is commanding attention in proportion as its merits and characteristics become known. The preference for it is increasing, and while it may possess some limited advantages over steam, and may possibly ultimately lead it in popular favor, especially where cost is no consideration, the merits of the two great systems for all practical purposes are quite or nearly on a par. It is more of a question of individual opinion than any great superiority of merits. Some who are unfamiliar with the subject question its utility in excessively cold weather, but the fact of its being almost universally the system used in the rigorous climate of Canada, and the colder portions of this country, as well as in most of the Federal buildings, show the lack of foundation for the objection. Canada, however, has recently become interested much more than formerly and is adopting it to a very considerable extent.

The assertion that hot water heating requires less attention than steam is incorrect aud misleading, The fact is, that as all steam boilers are furnished with automatic damper regulators which effectually control the temperature, and most being magazine feeders, hot water boilers which are provided with no damper regulator, and being surface feed, obviously require more looking after than steam boilers. The difference in pressure between the two systems is trivial, that of hot water depending on the height of the column of water, and in most instances this would increase the pressure somewhat more than necessary to be carried with steam. Hot water heating may be accomplished by direct, indirect, or direct-indirect radiation, the same as with steam, hence their ventilating facilities are equal. Heating by hot water is somewhat more expensive than by steam on account of the additional piping required, and as the heat is imparted from surfaces of lower temperature, much larger radiators are necessary; thus while less fuel may be necessary with hot water and quicker results obtained, the first cost is considerably more.

Hot water heat is mild, even and delightful, and eminently healthful; it is noiseless and steady in operation, and free from any dust, gas, smoke or other annoyances as produced by fireplaces, stoves and hot-air furnaces; the temperature produced is uniform, and the air being heated from surfaces of low temperature, is soft and humid and cannot become vitiated or deoxidated. There is no liability to overheat the atmosphere as the maximum pressure carried is usually from 180 to 200 degrees. Circulation in the system commences with the application of heat in the boiler' the radiating surfaces imparting heat to the surrounding atmosphere as long as heat remains in the boiler, or even after being withdrawn until the water contained in the system is equal in temperature to the atmosphere. In this respect some advantage is secured over steam as no heat is imparted until steam is generated, which requires 212 degrees Fahr. This is its greatest advantage—in giving off heat units as soon as heat is applied; with hot water at 200 degrees Fahr. usually the maximum amount of heat is being obtained, while with steam at this degree no change in the temperature of the atmosphere would take place, but 212 degrees Fahr. must be reached before any heat is transmitted.

The temperature can be controlled to meet the demands of the

weather entirely by the fire, which is very desirable in mild weather when sufficient fire only is necessary to keep the temperature in the apparatus to 100 or 125 degrees Fahr.; some economy in fuel is thus secured over steam heating during the fall and spring seasons. The temperature of the radiators may be controlled by means of the radiator valves without regulating the intensity of the fire in the boiler.

In summing up these curtailed remarks we would say that the heat from steam and hot water are almost identical, or if any slight difference it is incapable of being perceived and unimportant for all practical purposes. Steam heat is derived and imparted to the air at a much higher degree of temperature from a less amount of heating surface—while heat from hot water is given off at a lower degree of temperature from a much larger quantity of radiating surface.

Hot water heating is effected by the transmission of heat through the medium of water, giving off units of heat from surfaces of radiators, coils, etc., placed within the apartment to be warmed (direct radiation), or without, and conveyed through ducts to the desired place. (Indirect radiation.) The system of direct radiation is mostly employed in heating by water in residences—especially since the advent of the highly ornamental class of radiators—being less expensive in construction and more economical. The water is conveyed to and from the radiators by means of a system of flow and return pipes, of which there are two systems in use. A simple circuit has no branches, the water being carried directly from the boiler through a flow-pipe and returned again to the boiler through a return-pipe for each separate radiator; a compound circuit is made up of a number of simple circuits branching from a main circuit and returning into a main return-pipe, the main flow and return-pipes only connecting with the boiler. The radiators are supplied with valves for reducing the circulation and regulating the temperature, also air-valves for the exit of the air, as water evolves air while boiling and when cooling imbibes it. A small galvanized-iron tank open to the atmosphere—called an "expansion tank"—is placed a few feet above, and connected with the highest pipes of the system, for the purpose of keeping the apparatus filled with water and providing for its expansion; also to remove the air from the apparatus.

The displacement of the equilibrium, or interchange of positions of particles of water or other liquids of different density, is called circulation, and this movement takes place in all waters or liquids of whatever kind. The theory of circulation is based upon the law of gravitation and the force created by heat. Above 40 degrees Fahr. hot water will ascend and cold water will descend. The part performed by circulation is—that as the water is brought in contact with the radiators, piping, etc., and the units of heat given off through them to the surrounding air, the water contracts and becomes heavier than the water surrounding it, and falls by reason of its greater specific gravity, dispelling that which is warmer than itself, the warmer rising above it. Gravitation, however, is not the only principle involved in circulation. The force created by heat is probably the most important cause; the water is increased through heat by expansion, becoming lighter, and is forced upward to the top of the water or liquid, and at the same time the cooler particles of water are brought down by gravitation to the source of heat—the boiler—to receive units of heat in their turn and ascend.

By the above brief explanation the theory of the operation of a hot water system will be readily understood. The water is passed through the boiler from bottom to top over the heated surfaces, extracting and absorbing units of heat from the same during its passage, and flows into the flow or "up" pipes of the system to the several radiators, coils, etc., in the different rooms, where the heat is given off through these surfaces to the surrounding air in the apartments, and becoming cooler and denser, leaves the radiators, etc., and descending through the return or "down" pipes enters the boilers, and so on as before. It will thus be seen that this circulation is continuous and will take place as long as the water in the return-pipes has a lower temperature than that in the boiler and flow-pipes, or until the water of the system is of the same temperature as the air. An equality of temperature of different parts of the water cannot occur so long as any degree of heat is applied, as one portion is continually receiving heat while the other is as continually parting with it. The rapidity of the circulation through the system depends upon the intensity of the heat in the boiler and is in proportion as the water in the return-pipes is colder than that in the boiler. The water making complete circuits, it will be seen that beyond what little evaporation may take place the water in the system is used continuously.

E PARVO MULTUM.*

The Tragical and Lamentable fate of an Errant Bacillus Kochi: An Hysterico-Biographical, Laboratorious and Epical Episode done into Poetry of the Present Day.

BY KATISHA KATZENJAMMER,
Of the Bacteriological Institute, etc.
[Translated from the Japanese.]

A little spore in a culture grew,
Listen to my tale of woe!
Imbedded in a mass of glue,
Till a full-fledged bacillus it sprang into view.
Listen to my tale of woe!
Now, day by day its ambition grew;
Listen to my tale of woe!
Like the witch in Macbeth, who made the stew,
It said to itself, "I'll do! I'll do!"
Listen to my tale of woe!

CHORUS (at discretion).

It saw its chance in a day or two;
Listen to my tale of woe!
A draught of wind through the laboratory blew,
And out of a window the bacillus flew.
Listen to my tale of woe!
In a neighboring orchard a little peach grew;
Listen to my tale of woe!
The little bacillus came there too,
And Johnny Jones with his sister Sue.
Listen to my tale of woe!

CHORUS (at discretion).

Now, they ate the peach of emerald hue,
Listen to my tale of woe!
And swallowed the little bacillus too,
Which well in life its mission knew.
Listen to my tale of woe!
Now, the doctor was called to attend them two,
Listen to my tale of woe!
Who took from his pocket his microscope true,
And brought the bacillus into view.
Listen to my tale of woe!

CHORUS (at discretion).

He said, "Here's the cause of this cry and hue,"
Listen to my tale of woe!
For the comma-bacillus well he knew;
And he stained it red and he stained it blue.
Listen to my tale of woe!
In Johnny's corpse was a peach-stone or two,
Listen to my tale of woe!
In Susie's abdomen a little glue;
"Ah! here is infection and zymosis too,
'Tis sad to say; Boo-hoo! Boo-hoo!"
Listen to my tale of woe!

CHORUS (at discretion).

Now, all kind friends my advice to you,
Listen to my tale of woe!
Is when you are walking with a maiden true,
Avoid the peach of emerald hue.
Listen to my tale of woe!
And if, like Adam, you are tempted too,
Listen to my tale of woe!
Remember the fate of John and Sue,
Who ate the peach of emerald hue,
And the wicked bacillus that got stained blue.
Listen to my tale of woe!

CHORUS.

Hard trials for them two,
Johnny Jones and his sister Sue,
And the peach of emerald hue,
Also the comma-bacillus too.
Listen to my tale of woe!

*Chanted at the meeting of the Flint Club, of Baltimore, January 7, 1891. The President, Dr. George H. Rohe, in the chair.

CONVENIENT TO HAVE ABOUT.

Emery powder will remove ordinary stains from ivory knife handles.

To drive nails or screws into hard wood dip the points in oil or grease.

When broiling steak, throw a little salt on the coals, and the blaze from the dripping fat will not annoy.

To clean willow furniture use salt and water. Apply with a nail brush, scrub well and dry thoroughly.

Air the house thoroughly every morning. Open opposite doors and windows for five or ten minutes, even if it is stormy.

Spots of grease may be most effectually removed by the application of dry buckwheat flour.

It is stated that glycerine washed into flannel after it is wrung from the warm rinsing water will render it most agreeably soft. Half a spoonful of glycerine to a pound of dry flannel is the usual allowance.

Closets should be aired the same as bedrooms, and the coming architect, if a woman, will see to it that closets in which clothes are hung are provided with a window, be it ever so small, going out to the yard. This window will be protected so that in nearly all weathers it may remain open and supply the closet with fresh air and light.

A very good imitation of ground glass is produced by dissolving three tablespoonfuls of Epsom salts in a pint of warm water and applying it to the glass with a common paint brush. This answers admirably when a sort of screen is wanted. The solution must be applied to the side of the glass which is not exposed to the weather.

Steam is thick or thin according as it is hot or cold.

Three pounds of hot water per hour evaporated from each square foot of heating surface in a boiler is fair average for a good boiler.

A simple method of preserving bright metals from rust is to rub over the surface a mixture formed by melting together equal parts of ozokerit or paraffine and beeswax.

To take indentations out of furniture wet the indented places well with warm water; then take some brown paper five or six times doubled and well soaked in water, and cover the bruises. Then apply to the paper a hot flat-iron till the moisture is evaporated, and if the indentations have not disappeared repeat the application until the whole surface is completely level. Sandpaper, smooth, and re-varnish.

Solder that is white and crumpy from a deficiency of tin, only can be made good again by adding a little tin. Where only a small amount of soder is bad and does not improve by adding tin, it is generally best to make it up into fine solder, to be used with the copper-bit. For this reason good plumbers never fine up with bar or strip solder unless they know what it is made of. In cases of emergency, coarse solder will give a better result by heating a little above the usual temperature, and using the top without stirring, because the specific gravity of tin is a little less than that of lead, which gives the tin a tendency to float above lead.

Wrought iron pipe is said to expand 1-150,000 of an inch for each degree of test communicated to it. Take the length of your pipe in inches, multiply it by the number of degrees between the normal temperature it is required to attain when heated, and divide this by 150,000. Suppose your pipe is 100 feet long, and its temperature zero, and you wish to use it to carry steam at 100 pounds pressure—equal to a temperature of 338 degrees—multiply 100 feet by 12 to reduce it to inches, and by 338, the difference in temperature; divide this by 150,000, and will find the result to be 2.7 inches, which would be the amount of play that would be required in this instance, in your expansion point.

SCHOOL ROOM VENTILATION.

The Pennsylvania State Board of Health has issued the following circular, to the practical suggestions of which many others may be added according to the conditions of the rooom:

Foul air produces listlessness in schools perhaps more than any other one cause. *Beware of it.*

"In modern hygiene, nothing is more conclusively established, than the fact that vitiated atmospheres are the most fruitful of all sources of disease."—*Playfair.*

"Headache, nausea, and lassitude, great debility, impaired digestion, severe colds, consumption and other diseases of the respiratory system, as well as other serious diseases, may be caused by confinement in the foul atmosphere of an unventilated room."—*Dr. Frank Wells.*

"Though foul air is a slow poison, we must not forget that a blast of cold air may slay like a sword."—*Dr. Angus Smith.*

The air in the school-room should be pure, and warm, but not overheated. *Perfect* ventilation is secured when the inside air is as pure as that outside. The only way to determine the temperature of a room is by means of a thermometer, which should not be hung more than four feet from the floor. It should occasionally be placed near the floor, to see that portion of the room is not too cold. The proper temperature is from 65 to 70 degrees, Fahr. Children who complain constantly of being cold, are probably ill-clad or need more physical exercise. Try to keep the floor warm. A zinc cylinder about the stove will protect those near it. Keep a vessel of water on the stove to moisten the air of the room.

It is reported that many teachers do not know how to manage a coal fire properly, and that school-rooms frequently contain injurious amounts of coal gas. *When the stove door is opened, have the smoke flue or pipe free so that the smoke and gas will have active escape. Watch closely that gas does not escape into the room, as it is a cause of dullness and headache.*

An open fireplace with a small fire burning in it is the best means of ventilating a room yet devised. A ventilating flue to act must be warm, otherwise it will probably only be a funnel down which cold air will pour into the room. Windows should not be lowered in cold weather when a draught of cold air may fall upon the head of any pupil. Much fresh air may be introduced into a room by placing boards about six inches wide under the lower sash of each window in the room. A space will be formed between the two sashes where they come together at the middle of the window, through which a stream of air will enter the room. Another plan is to have a cylinder of zinc enclosing the stove. A hole is made in the floor underneath the stove, and from this hole a piece of stove pipe leads to the external air. The air about the stove will become heated and will arise, while to take its place a constant stream of air will pour into the space about the stove from outdoors. This air will be warmed before it passes into the room. It will be well for the teacher to have *fixed times on the daily programme at which* to throw open doors and windows several times each day, that all the stagnant air in the room may be removed. At these times all the children should be on their feet and exercising, and the windows should be closed some minutes before the children take their seats, in cold weather

TRAPPING AND VENTING.

Cleveland, O., April 18, 1891. Editor The Sanitary News: Plumbing is a subject which interests not only the plumber but the entire public, and there is no good reason why it should not be discussed by men with different ideas, which I think will prove to the public which is the best system of plumbing. I do not wish to tire the readers of the News by harping on my practical qualities as a plumber, but I connot help it; for like some more of my brother plumbers, I was not born with a silver spoon in my mouth, and, therefore, was not fortunate enough to be a college graduate and able to harp on my high flown language. That being the tact I have to fall back on my practical qualities, which I claim is right according to theory and practice. I claim to understand the theory of plumbing as far as it has advanced, and I have the practice to put it in operation. I am not like Col. George E. Waring. I don't believe we have anything perfect and the trade will advance in the future the same as in the past. I agree that no practice is good which is not founded on right theory. A man with a theory and no practice is on a par with the man of practice and no theory; but the man with both theory and practice is a thorough mechanic, and if he is a plumber I don't see where there can be any comparison between him and a tinsmith, as Col. Waring claimed. I do not wish to be

compared with Col. Waring; I am not a tinsmith, and never claimed to be, but as stated before, I claim to be a plumber and will leave it to the plumbers of this country to say how much a tinsmith can teach a plumber about the plumbing trade. I think Col. Waring's pulse was a little above fever heat when he made that assertion, and was no more responsible for what he said than he is to teach me the plumbing trade, and I think it has been clearly demonstrated how irresponsible he is, by assertions he has made and unable to back them up by a clear explanation. I asked him two questions which he did not answer.

The trap he speaks of I claim is vented; the stack it connects with always acts as a separate vent for the highest trap and therefore is no answer to the question. On the second question he is also mistaken. Under his system there would be a great many houses without a 4-inch stack, and in every house there are some fixtures that do not connect with the 4-inch stack going through the roof; and, therefore, would not be relieved from back pressure. I would like to know what causes a swirl of water around the walls of a vertical soil pipe. There is such between the fixture and the trap, but it is broken in the trap and drops straight down after it leaves the trap; and in that case it forces the air ahead of the water, causing a pressure on the lower fixtures which was clearly demonstrated to Dr. McLellan when he was in Cleveland exhibiting his invention.

Col. Waring claims that ventilation will not protect traps from siphonage, that the danger from evaporation is greater than from siphonage, and traps under ordinary circumstances will loose their seal in from nine to twenty days, all of which I dispute. Air will undoubtedly break a siphon; therefore, all that is necessary is to supply air, and if Col. Waring does not know how let him do as I say. Make the vent large enough and connect as I explained, and it will not only prevent the trap from siphoning but it will protect the vent opening being stopped up from filth thrown in by the action of the water, and the air between the vent branch and water in the traps is at rest and will protect the water from evaporating. The trouble with Col. Waring is that he has not had the practice of experimenting on his ideas by putting them into practical use. His argument on evaporation is exaggerated beyond reason. I can show him traps with fresh air vents and back air vents that have been connected and left standing for two years, and the seal is not broken; and I can show him where the "Sanitas" trap is in use and continually stopping up. As for the "Puro" trap, there is not one in use in Cleveland, but the construction of it shows that it will not work.

Col. Waring is like the Irishman with the bull; he struck him in the head with his fist, with the remark, By gor if I didn't knock him down I staggered him. He has attacked a question that is too great for him, and he will have to study more and in a different direction before he will be able to master it. His argument is contrary to nature and depends entirely on art which cannot be as practical, as nature has provided for everything that is practical and it depends on man to study them out. There is nothing perfect that is artificial, and therefore cannot be as practical.

The plumbers of to-day are tearing out work done by plumbers of the year 1847, and work done by tinsmiths in 1890. The plumbers of to-day have profitted by the work done by the plumbers of 1847, and never have and never will by the work done by tinsmiths. The plumbers of olden times have taught us what they knew and what they thought, and by a practical test of their doctrine we have discovered a great many errors, and I believe there are a great many more to be discovered. Follow out the laws of nature and you will discover that what is natural in practice is perfect, and that which is artificial is not perfect and cannot be. Col. Waring is wrong, from the very fact that the foundation of his argument is that nature is a failure, and that Waring, Putnam, and McLellan have produced something in art that will take nature's place. If I am wrong I wish to be corrected by some one who will explain where and why, and not simply say I am wrong. I may be wrong, but I am open for correction. Not so with Col. Waring. He claims that he is not subject to criticism; but I am criticising his assertion, and it is his place to explain and show why he is right, when he is so sure of it.

Respectfully, W. A. Kelly.

Professor Libbertz affixes the official name "tuberculin" to all vials of the Koch lymph given out at his laboratory.

PRACTICAL DISINFECTION.

The *Canada Health Journal* comments on Dr. E. Von Esmarch's methods of disinfection published in the *Hygienische Rundschau*, edited by two eminent men, Prof. Carl Fraenkel, of Konigsberg, and Dr. E. Von Esmarch, of Berlin. Von Esmarch enumerates some of the points that should be specially attended to in the use of the steam disinfecting apparatus, not only in large public institutions, but where the process has to be carried out on a comparatively small scale. He agrees with most authorities that steam, either circulating or under pressure, and without the admixture of air, is by far the best means of disinfecting clothing and other articles that will withstand the action of moist heat. As to whether circulating steam or steam under pressure is best, he thinks that it is entirely a matter of convenience, but it will be readily understood that where large chambers have to be constructed it would be difficult and extremely expensive to build them with sufficient strength to withstand any great pressure from within. Even in the case of smaller sterilizing chambers, the expense of obtaining them sufficiently strong is so great that in most cases their use is precluded.

The main desiderata for a perfect disinfecting apparatus are that it shall be close to the source of a steam supply; that there shall be sufficient steam developed to fill it thoroughly and keep up the temperature for some length of time; that the steam shall be sent in at the top and passed out the bottom, in order that every crevice of the apparatus may be filled; and that where it is used in large establishments, it shall be placed between two rooms, into one of which articles to be treated are to be taken, and passed in at one door of the sterlizer, while the other room should be at the other end of the sterlizer, and into it the clothes should be passed, so that they shall not again be brought into contact with unsterilized clothing, etc.

Articles that are to be disinfected should not be allowed to remain too long in contact with steam, and before being steamed they should be thoroughly heated, so that there is no opportunity for the steam to condense on cold surfaces, and in the same way they should be well dried by heat after the steaming process has been concluded. Twenty minutes is long enough to allow most ordinary articles to remain exposed to a moist heat of 100 deg. C., so that they should be left for this length of time after the temperature has once been raised to this point, this being determined by an electrical contact thermometer or a thermometer placed in a tube through which the steam escapes; some simple manometer should be used to determine the pressure that has been obtained by super-heating the steam. The greatest attention should be paid to this point of time of exposure, for it is the experience of all medical officers of health that nothing deters people from sending their clothes to be sterlized so much as the fact that they are frequently ruined by too long an exposure to the action of the steam.

A certain amount of discrimination must be used in determining what articles can be safely steamed, and an officer of health who ordered stamped plush, leather, skins, or waterproof material to be exposed to heat would render himself liable to be heartily laughed at by all practical men; whilst a washwoman would be able to advise him that linen or similar material placed in contact with iron would be absolutely ruined by "iron mould." Grease should always be removed if possible before the articles are put into the sterilizer, otherwise it becomes fluid and is liable to spread to other parts. Blood and pus are, of course, coagulated by the heat at the same time as they are sterilized, and can be afterwards removed by means of chlorine or other chemical solvents.

Musty bedding and old clothes should on no account be put into the sterilizing chamber along with the new articles and fine linen, as the fusty smell which is never destroyed by the heat is communicated from one to the other, and can only be got rid of by long-continued exposure to a plentiful supply of fresh air. Lastly, Dr. Von Esmarch insists that disinfected clothing should not be sent back to infected rooms, and that in all large towns there should be some establishment to which poor people might be taken whilst their houses and clothing are being disinfected. As the *British Medical Journal* says: "It may be said that these are all truisms, but they are truisms that are constantly being forgotten, especially by men whose experience is not very extensive."

FOR THE DIGESTION.

When two girls meet they kiss. When two men meet they don't. This shows plainly who want kissing the most.—*Pottsville Republican.*

A weight will soon be lifted from
The narrow parlor chair,
And soon the garden gate will have
As much as it can bear.

—*New York Herald.*

"I like your cheek!" exclaimed the girl when the young man kissed her. "So do I like yours, but I greatly prefer your lips," was the audacious reply.—*Somerville Journal.*

He taught his wife the sin of dress
With eloquence and power,
And then played billiards all day long
At 60 cents an hour.

She (archly)—"Don't you think age is beginning to tell on me?" He (warmly)—"No; age will never be so ungallant as to do that. And he will hesitate long before he lays a rude finger on so fair a face."—*New York Press.*

Love may be blind, but Love can see
That there's plenty of room for two
On one small chair, if they sit with care
And stick just as close as glue.

—*New York Herald.*

Fortune Teller—"A handsome young man is desperately in love with you. You will have three children, two boys and a girl; so I see in the cards." Young Lady—"Yes, but don't the cards have something to say about a wedding?"—*Texas Siftiugs.*

"What's reciprocity?" asked she.
He paused in thought as if to seek
A good reply, then gallantly
He bent and kissed her cheek.

Starting like some poor frightened deer,
Her cheek aflame with sunset red,
She soundly boxed him on the ear—
"That's reciprocity," he said.

—*New York Sun.*

May—"Belle Van Leer would have been a martyr in the Dark Ages." Stella—"What makes you think so?" May—"Why, you know, when she found that George Bond had lost all his money she said: 'If I marry him people will say I am a philanthropist, and I cannot and will not be ostentatious. So I shall give him up, though it break my heart!"—*New York Herald.*

The character of the man is told
By the the way his jaw runs in,
So, too, a woman may be judged
Quite easy by her chin.

—*Philadelphia Times.*

Dashaway—"I stood on the corner this morning for five minutes debating whether I should buy a bunch of roses for Miss Peterkin or a necktie for myself, when Travers came along and said he had bought her the roses." Cleverton—"So you got the necktie?" Dashway—"No, I had to lend the money to Travers."—*Clothier and Furnisher.*

"So she's going to lecture on how to manage a husband, is she? How many husbands has she had herself?" "Why, she's never been married."—*New York Press.*

"I've played at cards," said the lover bold,
To the rare and radiant miss,
"But I never have held nor hope to hold
So lovely a hand as this,"
As he softly pressed the fingers white,
Which he gently held in his own that night.

The maiden blushed from brow to chin,
As she said with bashful air:
"No other has sought that hand to win
With compliment so fair,"
And added in tones as soft as balm.
"That speech most surely takes the palm."

—*New York Press.*

A man naturally finds it necessary to have recourse to his "uncle" after he has "auntied" too much.—*Binghampton Leader.*

There are thousands of men who would do brave things in an emergency who make their wives get up every morning to kindle a fire.—*Ram's Horn.*

He (gazing at the stars)—"I wonder which are the evil stars?" She—"The ones that wink. Certainly such conduct is very reprehensible."—*New York Herald.*

Mrs. Noear—"Do you think my daughter will be a musician?" Professor—"I gant zay. She may. She dell me she gome of a long-lived vamily."—*New York Weekly.*

Watts—"Poor Timmins! I fear he is losing his mind." Potts—"Well, there is one consolation. When a man loses his mind he never misses it."—*Indianapolis Journal.*

"What's that, Helena! You want thirty marks more to spend! Wife, do you know what that sort of thing leads to?" "Certainly—to the millinery store."—*Fliegende Blatter.*

The Poet's Wife—"They say that poetry is a drug on the market." The Poet—"Nonsense! If you'd ever sold any poetry and bought any drugs you'd know the difference."—*Life.*

Old Scroggs—"What did you carve on that tombstone I ordered a while ago?" Monument Man—"'Augustus Scroggs, R. I. P.'" Old Scroggs—"That's all right; but if I am not better by to-morrow just make it 'G. R. I. P.'"—*New York Sun.*

REVIEWS AND NOTES.

The International Medical Annual. (New York: B. B. Treat.) Cloth, $2.75.

The ninth yearly issue of this valuable one-volume reference work is to hand; and it richly deserves and perpetuates the enviable reputation which its predecessors have made, for selection of material, accuracy of statement and great usefulness. The corps of department editors in number and ability surpass that of last year. Its numerous illustrations—many of which are in colors—make the "Annual" more than ever welcome to the Profession, as providing, at a reasonable outlay, the handiest and best resume of Medical Progress yet offered.

Part one comprises the New Remedies, together with a Review of the Therapeutic Progress of the Year.

Part two is devoted to Special Articles on Diagnosis: the first on Deformities of the Hand, and their Diagnostic value in Nerve Lessons; the second on the Character of the Sputum as an aid to Diagnosis.

Part three, comprising the major portion of the book, is given to the consideration of New Treatment; and is a retrospect of the Year's work, with numerous Original Articles by eminent authorities.

The fourth—and last part—is made up of Miscellaneous articles, such as Recent Improvements in Sanitation; Concerning Climatology and Hygiene; Alcoholic Inebriety, and the results of Asylum Treatment; Improvements in Pharmacy; Books of the Year, etc.

The arrangement of the work is alphabetical, and with its complete Index, makes it a reference book of rare worth.

In short, the "Annual" is what it claims to be—a recapitulation of the year's progress in medicine, serving to keep the practitioner abreast of the times with reference to the medical literature of the world. Price, the same as in previous years.

It is but fourteen months since W. T. Stead, the brilliant English journalist, established in London his *Review of Reviews.* Already it has attained a circulation of over 150,000 copies. It is said by those who know that the American edition of the *Review of Reviews*, the first number of which appears in a few days, promises to surpass in popular attractiveness the present publication, and its many excellencies, together with its low subscription price, assures it in advance a universal popularity and a large constituency. It is published in London and in New York at 52 and 54 Lafayette place.

CHICAGO MASTER PLUMBERS' ASSOCIATION

About forty members were present when President Whiteford called the meeting to order last Thursday evening. Messrs. Chas. Polachek, Wm. Wittig, and Herman Stolberg, master plumbers of Milwaukee, were present, and upon invitation of President

Whiteford occupied seats on the platform. Being called upon for an address Mr. Polachek replied briefly, thanking the association and expressing pleasure at being able to meet with them.

The application of Brunt Bros. for membership was referred back to the committee to be reported at the next meeting. J. J. Wade reported that the license committee had completed its classification of the plumbers of Chicago by wards, and hoped in the near future to have a chairman for every ward. He suggested that the Chicago master plumbers were not all doing their duty toward the committee in the matter of recommending licenses. He thought every such recommendation should first pass through the hands of the committee for its consent or rejection. Messrs. Murray, Boyd and Rock spoke in the same strain. After transacting other routine business, the Association went into executive session.

PLUMBING NOTES.

Mr. J. Attlesey, of 321 Vine street, Cincinnati, sends us an illustration of a plumbing system which he put in a fine office building known as the "Fosdick" in that city. The work, while elaborate to meet the demands of the building, is compact and up to the requirements of modern sanitation. It is a forcible illustration of the progress of plumbing, and demonstrates the fact that the plumber must be more than a mechanic. The illustration of the plumbing given in the pamphlet we received is a study, and would make a good object lesson in any of our trade schools.

The plumbers of Milwaukee, Wis., notified their men last Saturday night that they must either quit work or leave the union. The great majority of them decided to do the former.

The contractors are all adhering to their determination not to make any distinction between union and non-union men, and are refusing to treat with union men. There is little doubt that the strike will be general among all the building trades by May 1.

Nothing has occurred to indicate that the building trades strike is any nearer a settlement than it was three weeks ago. The contractors show no disposition to yield, and the strikers improve the shining hours each day by collecting at their union halls and devising plans of campaign. They extract such comfort as they can from the situation and confidently express the belief that the contractors will give in on or about May 1.

There was an old man who built a house,
And thought he would be as sly as a mouse;
So he hustled around and hustled about,
And hired as plumber a skin-flint tinner
Who proved himself an unholy skinner,—
And the old man's gone by the sewer gas route.

James Allison, the well-known Cincinnati plumber, is president of the Ohio Mechanics' Institute, the right man in the right place. At a recent meeting the following officers of that institution were elected: President, James Allison; Vice-president, James Leslie; Secretary, Frank S. Rohan; Treasurer, Hugh McCollum; Directors, Charles L. Wiltsee, Lawrence Grace, Walter Laidlaw, A. B. Champion, Robert Birkup, Wm. Griffith, P. G. March. President Allison, in submitting his annual report, said that "never in the history of the Institute has such marked development among the pupils been manifest than in the year just closed. Seven hundred and twenty pupils were enrolled, and their work has been far above the average. Referring to the proposition made to unite the Institute with the Technical School, President Allison said the present Board of Directors, following in the footsteps of their predecessors, have refrained from forming any alliance with other schools, or the acceptance of kindly proffers that have been made by some of our citizens for this purpose, preferring to pursue a course which the experience of many years has practically demonstrated is best calculated to promote the very best interests of a class that is afforded no such opportunities in any other school in our city or state. As evidence of this fact we point with no small degree of pride to the constantly increasing numbers and the splendid results attained by the young mechanics and others who have availed themselves of the school privileges of the Ohio Mechanics' Institute.

We trust the incoming administration will favor whatever is of best interest to the sanitary needs of our city. The plumbing inspectors now employed have proven their usefulness, and we trust that an increase of these inspectors will receive favorable recommendation.

Men who would not have a quack doctor attend them for nothing will hustle about to get a jerry plumber to do their plumbing and pay him more comparatively than a reputable plumber would charge. Some men are queer animals.

A little germ in a sewer grew,
And up the soil pipe quickly flew;
But alas!
On destroying lives its heart was set,
But the plumber's trap would never let
It pass.

The Indianapolis *News* says: "Under a law passed by the late Legislature the City Board of Health is preparing an ordinance which will require that all plumbing done in the city shall be exposed to view, and will provide that a city plumbing inspector shall be appointed, who shall receive a nice, comfortable salary for going about and inspecting it. The bill which passed the Legislature was the work of Senator Henry Hudson, and certain unkind persons predicted at the time that the Senator was fixing a pleasant position for himself. However that may have been, Mr. Hudson is now working up a little boom for himself for the job. There is some opposition to him developing as the fact of his candidacy leaks out, and there are many other candidates who will be heard from when the ordinance is passed." It should not be a question with the Indianapolis people as to what jobs were, or are, being fixed up. The kind of man for this important position is the only question. In the first place is he a practical plumber? If not he has not the first qualification or claim for the position. No man not a practical plumber can fill the office of plumbing inspector, and it is surely silly to talk of such a thing. Chicago has fully demonstrated that not only should the Chief Inspector be a plumber, but that his inspectors should likewise be practical men. Our inspection was little more than a farce till a plumber was placed at the head of the department and practical plumbers placed on the corps of inspectors. Now it is as near perfection as the limited number of inspectors can make it. What the Indianapolis people should insist on is that the inspector be a practical craftsman regardless of senator or anything else. It is presumption of the cheekiest sort for a man who knows nothing about plumbing to want to inspect it. It is simply ridiculous.

The luxury and healthfulness of L. Wolff's patent needle baths, with their perfect arrangements and depurating and invigorating qualities, should meet with a demand everywhere and be placed in every well appointed house. A home without this bath is without a luxury and an essential hygienic agency that nothing else can supply.

In olden times the sewer's breath
Swept through the mansions tall;
And filled the palaces with death
And every gilded hall.

But now we have a different way,
These ills will never come;
Because the plumber of to-day
Knows better how to plumb.

According to the list of subjects presented by M. L. Mandable, of the Sanitary Committee of the Master Plumbers' Association, we may expect some interesting papers and discussions on matters of interest to plumbers and sanitarians generally. This feature of the Master Plumbers' Associations is a valuable one and last year it was a pronounced success. Following is the list of subjects announced, on which papers will be read and then discussed:

"Building and Exhibition of Plumbing Materials," James J. Wade and Andrew Young.

"Manufactures and Specialties," A. W. Murray and David Whiteford.

"Closed or Open Meetings," T. P. Culloton and Henry Negley.

"Amalgamation of Master Plumbers' and Journeymen's Associations," Robert Griffith and Charles Byrne.

"Trade Protection," David Bain and William Bowden.

"Sub-Contracting," T. C. Boyd and D. F. Dewar.

"The Lien Law; what Protection does it Afford the Plumber?" J. H. Roche and C. Herbert.

"Country Plumbing, and Protection for the Country Plumber," Robert Thorogood and Charles Cavanah.

"Lead, Brass or Galvanized-Iron Pipes," Patrick Sanders and James Deveney.

"Soil, Waste and Ventilation Pipes," A. C. Hickey and J. J. Hamblin.

"Board of Examiners for Plumbers," Daniel Rock and J. H. Killian.

"Trade Schools," J. R. Alcock and Henry Black.

"Benefit of Plumbing Inspection," George J. Mertz and Rupert Coleman.

"Merits of Traps," J. F. Matthews and A. W. Kelley.

"Benefits to Contracting Plumbers Under the Present Rules," M. J. Carboy and J. P. Dalton.

The West Side Driving Park Association's new club house and grand stand will be, when completed, one of the finest buildings of the kind in the West. Of course the plumbing had to be in keeping with the rest of the building, and Reilly & Bro. of 517 W. Madison street are doing the work with their usual skill.

Messrs. Wm. Wittig, Herman Stolberg, William Halsey and Chas. Polachek, master plumbers of Milwaukee, were in Chicago yesterday to secure men to take the places of the striking journeymen in their city. They expressed themselves as well satisfied with the result of their brief trip, as a large number of competent workmen were secured. To a SANITARY NEWS representative, Mr. Polachek spoke with great earnestness concerning the ill-advised strike. "Some journeymen were sent to do work in a building," said he, "and they returned shortly, refusing to work because a hod carrier ormason employed there was not a member of the Trades Federation. The journeymen plumbers had absolutely no grievance against us aside from that, and the master plumbers very naturally failed to see why their own business should be ruined to help these hod carriers and masons. Then the journeymen plumbers tried to cripple us in many ways, believing that they would eventually be able to dictate to us. But the master plumbers of Milwaukee are not the kind to remain on the defensive very long. We met the journeymen more than half way, and declared a lock out. Now we are engaging all the workmen we want, and they recognize the fact that the interests of a lot of hod carriers are to be subordinated to our own.

Having outgrown through increasing business their quarters at 512 Ogden avenue, the C. J. Brooks Plumbing Company is this week removing to the larger and more desirable location at 879 W. Polk street.

WHERE PLUMBING WORK IS BEING DONE.

7110 Avenue A, Peter Schmidt; 2027 Armour ave., Wm. Bowden; 24 Ashland street, W. Aikens; 3950 Atlantic, J. B. Sheville; 6951 Addison, J. B. Sheville; Bradley near R. R. track, Frank Falk; 714 Belmont ave., R. H. McCabe; 4432 Butterfield, F. N. Kuhn; 8 Belmont ave., P. Schaeffer; Bradley bet. Noble and N. W. Ry., Frank Falk; Blanche and Noble, Frank Falk; 115 Clarence ave., J. A. Voltz; 2719 Cologne, J. J. Byrne; Clark and S. Water, P. Williams; 132 Centre, Chas. Reduske; 936-38 Central Park ave., W. M. Oliphant; 2516 Canal, M. Weber; C ave., J. J. Rourke; 2900 Cottage Grove ave., G. Overend; 2704 Dearborn, Wm. Bowden; 1003-1079 Dudley, J. J. Geiss; 5133 Dearborn, F. N. Kuhn; 5332 Dearborn, W. Bowden; 501 Dudley, C. C. Breyer; 5206 Dearborn, J. B. Sheville; 9134 Erie ave., Brunt Bro.; 8919 Exchange ave., Webster & Crombie; 6512 Evans ave., J. B. Sheville; 165 Flournoy, Hamblin Co.; 18 Fay, Nelson & Ceelhoffen; 3320, 3403 Fisk, J. J. Byrne; Fletcher east of Paulina, McCabe, 227 Francisco, G. Miller; Forty-seventh and Centre, E. Breyer; 1917 Forty-seventh, Cotter & Sons; 637 Flournoy, Harvey & Mose; 216 Forty-sixth, J. B. Sheville & Co.; Fiftieth east of Halsted, J. B. Sheville & Co.; 231 Fremont, C. J. Brooks; 106 Fremont, N. Bauer; 1619 Grace, Valentine Ruh; 735 Girard, T. Foley; 3204 Halsted, J. Breen; 323 Huron, Nelson & Ceelhoffen; 1708 Halsted, Minzesheimer; 98 Hastings, W. J. Morrissey; 5638-40 Halsted, P. Schmidt; Halsted and Fifty-eighth, Gunderman Bro.; 357 Harrison, W. Oliphant; 6616 Honore, D. T. Dewar & Co.; 30-34 Humboldt, C. C. Breyer; 301 Hudson ave., H. Breyer; 235-37 Indiana, Burkhardt; Johnson Place, T. Harvey; 857 Kedzie ave., J. B. Breen; Kingsbury and Kinzie, D. F. Shay; 147 Laughton, Nelson & Ceelhoffen; 6942 Laflin, D. F. Dewar & Co.; Larrabee and North ave., A. Watson; 3127 Lowe ave., C. C. Breyer; 919 Melrose, H. W. Harker; 451 Marshfield, McDonald; Madison cor. Homan, D. J. Jack; 2620 Mary, J. J. Byrnes; 541 Market, Frank Falk; 898 Maplewood, Harvey & Mose; 720 Maplewood, Harvey & Mose; 1069 Milwaukee ave., C. C. Breyer; 5801 Madison ave., J. B. Sheville; 182 Ninety-first, J. H. Scanlan; Oakwood and Lake ave., Wilson; Oakley and Frankfort, C. C. Breyer; 3238 Portland, J. H. Killian; Paulina and W. Division, Jas. Walsh; 7410 Peoria, Dewar & Co.; Powell ave. and Alice Place, Nelson & Ceelhoffen; S. Park near Fifty-seventh, Wilson; 499 Paulina, C. C. Breyer; 889 Racine ave., McCabe; Roscow and Clark, F. Neustadt; Rockwell and Potomac ave., C. C. Breyer; Randolph and Jefferson, J. J. Wade; 104 Samuel, C. F. Klentz; Sixty-first near Winter, P. Schmidt; Sixty-fourth bet. Harvard and Stewart, P. Schmidt; School and Fifty-first, F. N. Kuhn; Shields ave. near Twenty-seventh, Wilson; 634 Seymour, Nelson & Ceelhoffen; Sixtieth and Carpenter, J. Conraths; State and Sixty-sixth, D. F. Dewar; 752 Seymour, Harvey & Mose; 535 Sacramento, Harvey & Mose; 109 Twenty-ninth, J. J. Walsh; 1245 Twelfth, Foster; Troy north of Twelfth, J. Welsh; Tracy ave. bet. Fifty-eighth and Fifty-ninth, J. Conraths; Thirteenth near Waller, R. J. Morrissey; 5433 Tracy ave., J. B. Sheville; 94 Twenty-fourth place, M. Weber; 3149 Union ave., J. Teutsch; Vernon ave. and Thirty-seventh, D. Whiteford; 465 Wood, C. F. Klentz; 530 Washington, McDonald; 49 Wenthrop ave., W. Bletch; 5617 Winter, P. Schmidt; 3141 Wall, J. Teutsch; 1153-55 Western ave., W. & J. Rankin; 4403 Wentworth, J. Teutsch; 609-11-13 Wells, Valentine Ruh; 6728 Wabash ave., S. W. Skinner; 6814 Wentworth ave., L. Clark; 531 Washburne ave., John Watson; Winter and Sixty-eighth, D. F. Dewar; 888 Washtenaw, Harvey & Mose.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Treat & Foltz have prepared plans for a 5-story factory, 250x170, for the New York Biscuit Company, to be erected on West Randolph street, between Sangamon and Morgan streets; cost, $350,000. Also a 3-story flat building for C. W. Seneco, to be built at 356 Belden avenue; cost, $25,000. A 4-story and basement flat building, 99x133, to be built for Wm. C. Goudy at the corner of Cleveland and Fullerton avenues, cost, $50,000; and a 4-story basement store and flat building to be built at the corner of Chicago avenue and May street, to cost, $25,000. L. B. Dixon has in course of preparation plans for two 3-story residences, 50x90, to be built at Michigan avenue and Thirty-seventh place for Nelson Morris and A. M. Rothschild. Each will cost $100,000. L. Schaub has prepared plans for a 6-story factory, 85x125, to be built at the corner of Park avenue and wood street by Karpen Bros.; cost, $50,000. He has also planned a 3-story and basement store and flat building, 40x90, to be erected at the corner of North and Western avenues by Peter Mueller; cost, $6,000. Thomas Hawkes has prepared plans for a 6-story and basement factory, 50x100, to be erected on Illinois street, near Cass, by V. C. Price; cost, $40,000. Also for the same person a 3-story and basement store and flat building, 44x56, to be built on Division, near Penn street; cost, $12,000. August Fiedler has planned a 2-story basement and attic residence, 30x70, for A. E. Leicht, to be built on Fullerton avenue, near North Clark street; cost, $40,000. George Beaumont has planned a 3-story and basement flat building, 45x64, for Stephen C. Clarke, to be erected on Fletcher street in Lake View; cost $15,000. Taber & Pagels have planned a 3-story and basement store and flat building for Miss Meidenbauer, to be built on Western avenue, near Congress street; cost, $16,000. Charles F. Sorenson has planned a 3 story and basement flat building, 22x68, for E. Lind, to be built on Eighteenth street, near Center; cost, $16,000. Treat & Foltz have planned a 2-story and basement addition, 48x54, to the Lincoln Park Sanitarium; cost, $10,000. L. G. Hallberg has planned a 3-story and basement residence, 25x70, for himself, to be built an Dearborn avenue; cost, $10,000. Wolf & Lehle have just closed contracts for the construction of a large brewing plant for the Minneapolis Brewing and Malting Company, Minneapolis, Minn.; cost, $450,000. The same architects are designing the new Bavarian Brewery to be built on Wallace, near Forty street. Gustav Thiel has planned a

2-story and basement residence, 25x65, for Frank A. Stauber, to be built at Potomac avenue and Rockwell street; cost, $5,000 Also a 2-story and basement flat building, 22x55, to be built at 810 North Ashland avenue by R. Prueckner; cost, $10,000. Also, for Henry Gainer, a 4-story and basement store and flat building, 48x100. Frederick Baumann & J. K. Cady have planned a 2-story basement and attic residence for D. A. Mudge, to be built at Evanston; cost, $12,000. Also, for W. D. Griffen. they have planned a 2-story basement and attic frame residence; cost. $10,000. Bettinghofer & Hermann have planned a 4-story and basement store and flat building, 26x100, to be built on Western near Gault street, by John Bohn; cost, $20,000. They have also planned a 2-story flat building for B. J. Schneider, and for Miss L. McGuire a 3-story flat building of pressed brick and stone. Julius Wegemann has been instructed by the Board of Commissioners o prepare plans for a 2-story addition to the Cook County court house; this will be of steel construction and absolutely fire-proof. ——Philadelphia, Pa.: James M. Seabury will break ground at an early date for about fifty handsome houses at Fifty-second and Viola streets. Forty dwellings will be erected at Forty-first street and Mantua avenue by Clarence M. Busch. A large hotel will be built at Kanawha, W. Va., after plans prepared by Harrison Albright, of No. 508 Walnut street. About 300 houses will be erected upon a tract fronting on Clearfield, "F" and "G" streets and Allegheny avenue which has just been secured by Samuel Harner. Architect J. Franklin Stuckert has invited estimates for a large 7-story office building to be built on the south side of Filbert street west of Thirteenth for Dunlap & Clark. Architect Thomas P. Lansdale has prepared plans for a new hall to be built at Conshohocken for the Patriotic Order Sons of America. Pemberton & Co., and Messrs. Hunter & Nock will soon start large building operations at Thirty-second street and Columbia avenue. On the west side of Second street north of Chestnut, H. O. Atwood will soon erect a handsome structure, with large store-rooms on the first floor. The new building will be four stories high, of brick, with ornamental stone trimmings. Contractors are estimating upon the plans prepared by Architects Fielding & Day for the new Y. M. C. A. building to be erected at Germantown. An edifice of massive proportions will be erected on the lot adjoining the Baptist Temple, at Broad and Berks street, by the congregation of Keneseth Israel Hebrew Church.——Cincinnati, Ohio.: J. W. McLaughlin has designed for A. G. Goshorn a 2-story stone residence, to be built at Fifth and Walnut streets at a cost of $30,000. S. Hannaford & Son have designed for the Methodist Book Concern a 7-story printing establishment, 60x90 to be built on West Fourth street at a cost of $50,000. S. S. Godley has designed for Mrs. J. E. Rumbaugh a 3-story brick and stone residence, to be built at Asheville, N. C., at a cost of $25,000. G. & T. Brink have designed for Dr. J. H. Rendigs eight residences and flats, 3½-stories high, brick and stone, to be built at a cost of $30,000. Charles Diss has designed for W. T. Wagner & Sons a 3½-story tenement, to cost $7,000, and for Peter Widman a $5,000 frame residence. Martin Fisher has designed for F. Gausman a 3-story brick tenement, to be built at a cost of $5,300. ——Pittsburgh, Pa.: Architects Scott & Peoples have plans for one brick and one frame house for Mr. Frank Wilbert; the houses will cost about $10,000.——Washington, D. C.: Chas. Volland will erect an edifice for the German Reformed Congregation at the corner of Sixth and N streets; cost, $15,000. N. T. Haller has designed a residence for Carl Youngs, to be built on S street, between Thirty-third and Thirty-fourth streets; cost, $5,000. Fava, Naeff & Co., are preparing plans for the Metzeratt Music Hall, to be erected on Twelfth street near F.——Greencastle, Ind.: A building for the theological department of DePauw University will be erected.——Indianapolis, Ind.: The Columbia Club House is to be remodeled at an expense of $10,000. Bishop Chatard is considering plans for a new Catholic church building. It is hoped that $250,000 may be available for the erection of the building, which it is intended shall be the finest church edifice in Indiana. ——Baltimore, Md.: Building Inspector Oster has submitted to the Mayor plans for a new school building to contain 24 rooms. ——Salt Lake, Utah.: V. Kralo is preparing plans for an office building to be erected by Mr. Dooley; cost, $650,000.——Pueblo Springs, Colo.: The Pueblo Springs Sanitarium Co., will build a hotel to cost $150,000. A. M. Stuckert, of Denver, is preparing the plans.——Sioux City, Ia.: Chas. P. Brown has prepared plans for a City Hall; cost, $125,000.——Helena, Mont.: The city will spend $100,000 for school buildings. An opera house is to be built at a cost of $150,000.——Boise City, Idaho.: A special election will be held to decide the question of bonding the city for $40,000 for a city hall.——Cascades, Ore.: It is rumored that the Union Pacific will build a $65,000 hotel here.——Colusa, Cal.: John M. Curtis has plans for a $20,000 temple, to be erected by the Masons. Also a 4-story Odd Fellow's hall.——Portland, Ore.: Henry Weinhard will erect a 5-story building on Third and F streets; cost, $85,000. H. H. Northrup will build a 4-story building on Twelfth and Madison streets; cost, $75,000.——Owosso, Mich.: Malcomson and Higginbotham have prepared plans for a church edifice for the Congregational Society, to cost $25,000.——Independence, Ia.: A syndicate headed by W. A. Wells of Dallas, Texas, and C. C. Lindslay of DesMoines, Iowa, will erect a $100,000 hotel.——Boulder, Colo.: A club house to cost $10,000 will be erected by Edwin Williams and others.——Colorado Springs, Colo.: A brick hotel will be erected by Mr. A. Long; cost, $75,000.——Chattanooga, Tenn.: Hunt & Lamm have plans for the new building to be erected on Harrison avenue for the Baronen Erlayer Hospital. The cost will be $40,000.

HEATING AND LIGHTING.

Pecatonica, Ill.: The Pecatonica Electric Light and Power Company has been incorporated here with a capital stock of $10,000. Incorporators, J. W. Wolvin, F. W. Colby and others.——Monterey, Cal.: The Monterey Electric Light and Power Company has been incorporated here with a capital stock of $250,000. Incorporators, E. Ingram, S. W. Smith and others.——Milford, Pa.: It is proposed to establish an electric lighting plant.——Lodi, Cal.: The Bay City Gas, Water and Electric Works has been incorporated here. Capital stock, $160,000. For particulars address George S. Buckland.——Columbus, Ga.: Extensive improvements are about to be made to the plant of the Columbus Gas Light Company.——Sharon Hill, Pa.: It is proposed to establish an electric lighting plant here.——Niles, Ohio.: The projected gas plant for this city will be established at once.——Greenville, S. C.: The Greenville Gas, Electric Light and Power Company has been organized with a capital stock of $55,000. Address F. W. Poe for information.

SEWERAGE NOTES.

Boise City, Idaho: An election will be held to decide the question of bonding the city for $50,000 for a sewerage system.——Baker City, Ore.: A committee of trustees has reported in favor of expending $30,000 on a sewerage system.——Montclair, N. J.: The towns of Montclair and Bloomfield will construct sewerage systems if they can arrange with the city of Orange for the use of an outlet sewer——Sioux City, Ia.: City Engineer E. C. Loweth can furnish particulars regarding a proposed system of sewerage. ——Woonsocket, R. I.: A bill has been introduced in the Legislature authorizing the city to issue bonds for a sewerage system. ——Swampscott, Mass.: Mr. Rudolph Hering has made surveys and plans for a sewerage system which the town board will take under advisement. Town Clerk George T. Till may be addressed for particulars.——Westfield, Mass.: The town will expend $25,000 in the construction of sewers.——Nantucket, Mass.: A committee consisting of John A. Beebe, William H. Tice, and W. W. McIntosh has been appointed to consider the feasibility of sewerage for the town.——Kansas City, Mo.: Two new sewers will be built at a cost of about $60,000. Address City Engineer Butts for information.——Anderson, Ind.: The city will lay 15½ miles of sewer pipes this year varying from 8-inch pipe to 40-inch brick. Mr. H. Rawie is city engineer.——Clinton, Ia.: Mr. C. P. Chase, city engineer, is preparing plans for a system of sewerage.——Asheville, N. C.: An election will be held in May to decide the question of issuing $640,000 in bonds for sewer and street improvements.

WATER WORKS NOTES.

Woonsocket, R. I.: The Rhode Island Legislature has under consideration a bill authorizing the city to borrow not to exceed

$100,000 with which to build a system of water works.——Rutland, Vt.: It is intended to put in a new water supply.——Bedford, Ind.: A system of water works will be established at once.——Dothen, Ala.: Bonds for establishing a system of water works are soon to be issued.——Torrington, Conn.: The water supply will be increased by the addition of a third reservoir of from 60,000,000 to 75,000,000 gallons capacity, and two miles of water mains.——Kent, Wash.: The indications are that the water works projects is about to be put into execution.——Schenectady, N. Y.: The Common Council has been authorized to issue bonds in the sum of $315,000 for a new water supply.——Webster, S. D.: The people will vote on a proposition to bond the city for $10,000, to construct an artesian well and a system of water works.——Union, Ore.: Surveys and plans will be made for a system of water works.——Albert Lea, Minn.: The people have voted in favor of water bonds. C. A. Briggs is city clerk.——Kansas City, Mo.: An election will be held Tuesday for the purpose of voting on the question of issuing bonds to the amount of $2,000,000, with which to erect a new water works plant.——Tacoma, Wash.: The project for establishing a new water supply for this place is now in the hands of Nelsen Bennett, who can furnish particulars.——Detroit, Mich.: The Water Commission has authorized the laying of numerous additional mains. Commissioner Caskey can furnish particulars.——Fairhaven, Wash.: An election will be held on May 2, for the purpose of authorizing the bonding of the city for $250,000, to enable a complete system of water works to be built.——Macomb, Ill.: Water works will be put in at a cost of $40,000. Address J. S. Gash.——Holland, Mich.: The city will expend $17,000 for water works.——Danville, Ind.: The town is agitating the question of water works.——Oklahoma, Ind. Ter.: Consulting Engineer Chas. H. Ledlie, of St. Louis, Mo., is preparing plans and specifications for a complete system of water works to be put in by a private company. There will be eight miles of mains and seventy-five fire hydrants.——Grinnell, Ia.: It is proposed to build water works.

BIDS AND CONTRACTS.

West Point, N. Y.: Sealed proposals, in triplicate, will be received until noon, May 20, for the erection of twenty sets (ten buildings of two sets each) of quarters for enlisted men, as per plans and specification to be seen at the office of the Quarter master, U. S. Military Academy.——South Bend, Ind.: Proposals are wanted until April 27, for the construction of numerous sewers. Address C. Hunt, city clerk.——Greenville, Ala.: Proposals will be received until May 1, for building a Baptist brick church. Address J. H. Foster.——Westfield, Pa.: Proposals are wanted until May 1, for pipe, hydrants, trenching, and a 500,000-gallon reservoir. Address J. H. Millar, President Westfield Water Company.——Austell, Ga.: Proposals are invited for furnishing an electric plant of 300 lights. Address Mayor C. J. Shelverton.

SHAKSPEARE HEARD FROM.

At a seance in Chicago some evenings since, the spirit of Shakspeare, being called upon for a sonnet, began as follows:

"That teacher is a rank galoot
Who does not use the Wabash Route
In going to Toronto;——"

At this point the representative of a competing line, who was present, fell dead and Shakspeare vanished. If the spirit had been allowed to finish, it would doubtless have given as a reason for this beautiful sentiment, that the Wabash is the only line running through sleepers from Chicago to Toronto, and, at the same time, giving passengers choice of two routes (Grand Trunk and Canadian Pacific) from Detroit. For maps and full information, write F. A. Palmer, 201 Clark street, Chicago, or G. J. Lovell, 154 E. Third street, St. Paul, Minn.

RHYME AND REASON.

All teachers who go to Toronto
This important fact should be onto:
That the Wabash Railway
Runs two trains a day,
With through sleeping cars to Toronto.

For Maps, and full information in regard to the coming National Educational Convention, address F. A. Palmer, 201 Clark street, Chicago, or G. J. Lovell, 154 E. Third street, St. Paul.

Mrs. Edison lately gave a ball at which the music was furnished by phonographs.

A gun to fire under water has been invented, and one for the United States ship Destroyer is in course of construction at Bethlehem, Pa. This experimental gun is to be 35 feet long, and will throw a projectile 25 feet in length, containing 400 pounds of nitro-glycerine, 1,000 feet through the water.

A Roman doctor has discovered in many of the skulls found in Etruscan tombs, as well as in those deposited in various museums, interesting specimens of ancient dentistry work and artificial teeth. Some of these skulls date as far back as the sixth century before Christ, proving that dentistry is not a modern art.

The earliest known lens is one made of rock crystal, unearthed by Layard at Nineveh. This lens, the age of which is to be measured by thousands ot years, now lies in the British Museum, with its surface bright as when it left the maker's hands. By the side of it are very recent specimens of lenses which have been ruined by exposure to London fog and smoke.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

CHICAGO, MILWAUKEE & ST. PAUL RY.

Electric Lighted and Steam Heated Vestibuled Trains, with Westinghouse Air Signals, between Chicago, St. Paul and Minneapolis, daily.

Through Parlor Cars on day trains between Cnicago, St. Paul and Minneapolis.

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Daily Trains between St. Paul, Minneapolis and Kansas City via the Hedrick Route.

Through Sleeping Cars, daily, between St. Louis, St. Paul and Minneapolis.

The finest Dining Cars in the World.

The best Sleeping Cars. Electric Reading Lamps in Berths.

6,100 miles of road in Illinois, Wisconsin, Northern Michigan, Iowa, Minnesota, Missouri, South Dakota and North Dakota.

Everything First-Class.

First-Class People patronize First-Class Lines.

Ticket Agents everywhere sell Tickets over the Chicago, Milwaukee and St. Paul Railway.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

KOCH'S LYMPH.

Dr. Koch's lymph will doubtless prove a great boon to suffering humanity, but it is yet in the experimental stage. The remedial value of the waters at Hot Springs, Ark., has been demonstrated. This great health and pleasure resort is reached directly via the Wabash road. Compartment sleepers Chicago to St. Louis, where direct connection is made with a double daily line of sleepers for Hot Springs. Berths reserved through.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

PLUMBERS' SUPPLIES.

The Whittaker Supply Co., 151 W. Washington street.

SEWER BUILDERS.

Dee, Wm. E., 116 E. Quincy street, Telephone 2992.
Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Breyer, E., 72 W. Randolph street.
Breyer, C., 833 Milwaukee avenue.
Canty, John, 3105 State street.
Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Reilly, Joseph & Bro., 517 W. Madison street.
Ruh Valentine, 548 Wells street.
Sanders, P. & Son, 1413 Wabash avenue.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN 25 years of age, eleven years' experience at plumbing and gas-fitting; considered a first-class hand, and a fast workman; have been in business for myself (up to Jan. 1st) nearly 5 years; understand drainage, drawing plans and estimating thoroughly; job in growing town in the South preferred. Must be steady. Address PHILADELPHIA PLUMBER, care THE SANITARY NEWS.

SITUATION WANTED AS TRAVELING SALESman in the line of plumbing or steam goods. Have had several years experience in retail store, can estimate any of this kind of work; strictly temperate. Address, R. B. this office.

SITUATION WANTED.—BY A YOUNG MAN who has had one year's experience with supply house in this city. Some expeaience with stock and is well acquainted with prices. Address R. J., care THE SANITARY NEWS.

SITUATION WANTED.—BY A YOUNG MAN as book-keeper in a plumber's office. Have had several years' experience in that line of business. Address, "M. F.," care of THE SANITARY NEWS.

WANTED.—A POSITION AS GENERAL SUPerintendent or foreman in plumbing establishment, by a Philadelphia practical plumber. One who understands the business thoroughly, and also the chandelier business. Has been in business and has been foreman in chandelier factory and has been plumbing inspector in Philadelphia. Can estimate from plans and specifications, and can draw plans. Address, W. 412 Greenwich St., Philadelphia, Pa.

SITUATION WANTED.—WITH MANUFACturer or Jobber in the supply business, by an unmarried man of good address. Have had seven years experience with the Plumbing and Steam Heating trade in the East and am rated as a salesman of ability. Can give reference. Address W. M., care of THE SANITARY NEWS.

SITUATION WANTED—BY A PRACTICAL man as book keeper in plumbing shop. Thoroughly understands the business. Address, F. D. GASSMERE, 3632 Wentworth Av., Chicago, Ill.

SITUATION WANTED—BY A YOUNG MAN to take full charge of a plumbing supply business. Has had ten years' experience and can furnish the best of references, as to character and ability. Address, "W," care THE SANITARY NEWS.

SITUATION WANTED—AS RETAIL GAS FIXture salesman, or plumber's book-keeper and collector. Might form a partnership with some practical plumber who is already established. Ten years' experience, abundance of references. Address, K. C., care THE SANITARY NEWS.

SITUATION WANTED—BY A PLUMBER, GAS and steam fitter; 22 years old; single; strictly temperate; served four years. Can furnish good references and would like work in or near Chicago. Address, "W. A. F.," care of SANITARY NEWS.

WANTED.—POSITION BY A GRADUATE engineer; three years experience in city work and one year as instrument man on railroad construction, fair draughtsman and letterer. Reference given. Address, Engineer, care THE SANITARY NEWS.

SITUATION WANTED.—By a married man, position as traveling salesman for plumbing, gas fixtures, or steam fittings; or would take charge of plumbing shop. Am a practical plumber and gas fitter. Have been in business. Can furnish satisfactory references. Address, "T. B." THE SANITARY NEWS.

SITUATION WANTED.—A YOUNG MAN OF 19 desires a place to finish up his trade at plumbing and gasfitting; has had one and a half years experience. Address, J. H. S., 1018 Market St., Pottsville, Pa.

SITUATION WANTED—BY A PRACTICAL water-works man; is a first class meter hand, having had eight years' experince on meters. Address, "Meter," care THE SANITARY NEWS.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED—AT ONCE—TEN FIRST-CLASS responsible salesmen who thoroughly understand the plumbing, steam-heating, gas-fitting, and machine supply business, to sell to the jobbing and small trade. WESTERN MERCANTILE CO., C. N. HOOPER, Manager, Dubuque, Iowa.

WANTED.—A MAN ABOUT 30 YEARS OF age who has been accustomed to working specialties with Architects. Address J., care of THE SANITARY NEWS.

WANTED.—A GOOD PLUMBER, GAS AND steam fitter. Married man preferred. Must be sober and reliable. Steady employment. Wages $18.00 per week. Address H. C., care THE SANITARY NEWS.

BUSINESS CHANCES.

FOR SALE.—A PROSPEROUS PLUMBING business, located in one of the best cities of the Ohio valley. Reasons for selling. Full particulars. Address GAS, care THE SANITARY NEWS.

PROFESSIONAL.

HENRY ROBERT ALLEN, MEM. SAN. INST. Surveyor, 50 Finsbury Square, and 319 Victoria Park Road, South Hackney, E. London inspects houses and furnishes reports of their sanitary condition. Terms moderate. References. London agent for THE SANITARY NEWS, published at 88 and 90 La Salle street, Chicago, Ill., U. S. A. Money orders and checks should be made payable to THE SANITARY NEWS.

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Topographical Work and the Laying out of Towns.

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WM. PAUL GERHARD, CIVIL ENGINEER, author of "House Drainage and Sanitary Plumbing," "Guide to Sanitary House Inspection," etc., offers advice and superintendence in works of sewerage, water supply, ventilation, and sanitation. Sanitary arrangement of Plumbing a Specialty. Work in Chicago and the West particularly desired. Correspondence solicited. 39 Union Square, West, New York City.

JOSEPH B. BURTT,
ATTORNEY-AT-LAW,
(Formerly connected with THE SANITARY NEWS,)
Makes a specialty of Plumbers' Claims and the Mechanics lien law.
LA FAYETTE BUILDING,
Suite 42, 68 74 La Salle Street, CHICAGO.

SEALED PROPOSALS.

SEALED PROPOSALS WILL BE RECEIVED at the office of the Supervising Architect, Treasury Department, Washington, D. C., until 2 o'clock p. m., on the 1st day of May, 1891, for furnishing all the labor and materials required to put in place complete, the system of plumbing for the U. S. Court House, Post Office, etc., building at CLARKSBURGH, WEST VIRGINIA, including the finishing of the four rooms in attic, in accordance with the drawings and specification, copies of which may be had on application at this office, or the office of the Custodian of Clarksburgh, W. Va. Each bid must be accompanied by a certified check for $100.00. The Department will reject all bids received after the time herein stated for opening the same; also bids which do not comply strictly with all the requirements of this invitation. Bids must be enclosed in an envelope, sealed and marked "PROPOSAL for the Completion of Plumbing, Attic Rooms, etc., for the U. S. Court House and Post Office, etc., Building at Clarksburgh, West Virginia," and addressed to
JAS. H. WINDRIM,
April 8, 1891. Supervising Architect.

PLUMBERS' CARDS.

*DAVID WHITEFORD, PRACTICAL PLUM*ber and Gas-fitter. Sanitary plumbing a specialty. 372 W. Randolph Street, Chicago, Ill.

P. HARVEY, SCIENTIFIC AND PRACTICAL Plumber, 540 Thirty-Ninth Street, between Michigan and Indiana Avenues, Chicago. Residence, 3629 Dearborn Street.

BUILDING PERMITS.

John Demster, 3-sty and cel brk flts, 21x53, 506 N. Lincoln st; a, Wm. Ohehaber	$7,000
C. Schwartz, 2-sty and bst brk flts, 23x79, 30 Fullerton ave	8,800
John Gasdon, 2-sty and bst brk flts, 35x30, 360-62 Belden ave	5,000
Mrs. Emma Laurux, 3-sty and bst brk dwlg, 24x60, 2124 Dearborn st; a, J. Speyer	9,000
M. Gutrich, 3-sty and bst brk dwlg, 25x54, 2024 Butterfield st	5,600
Mrs. Caroline Hagek, 3-sty brk flts, 21x70, 474 S. Union st	5,700
Frank Ammon, 3-sty and cel brk dwlg, 26x48, 245 Osgood st	5,000
R. E. Evans, 2-story brk strs and flts, 100x50, 756-58 35th st; a, H. B. Wheelock	8,000
Frank Fisher, 3-sty and cel brk flts, 24x57, 239 Osgood st; a, F. W. Thompson	5,500
F. W. Ewart, 3-story and cel brk str and flts, 24x50, 3628 Wentworth ave	6,000
Dr. V. C. Price, 2 3 sty and cel brk strs and flts, 342x52; a, Thomas Hawks	7,000
Mrs. Jennie H. Bauld, 3-sty brk flts, 23x63, 1274 Van Buren st; a, J. H. Oskins	10,000
Jas. Kukuska, 3-sty and bst brk flts, 20x32, 832 W. 18th st	6,200
Victor Bardowski, 4-sty and bst brk str and flts, 25x106, 638 Noble st	15,000
F. Mancel, 4-sty and bst brk rear addn, 24x60, 845 Ashland ave; a, J. Seymoek	8,000
V. Bechyne, 4-sty and bst brk flts and str, 25x60, 607 W. Harrison st	8,000
J. L. Lindskogg, 5-sty and bst brk str and flts, 24x72, 108 Oak st	10,000
Edward Ederer, 5 sty and bst brk str and flts, 20x110, 208 N. Clark st	13,000
Jos. Stroud, 3-story and cel brk flts, 20x66, 908 W. 19th st; a, A. Charvat	15,000
Francis Anderel, 3 sty and bst brk flts, 21x67, 169 Bunker st	5,400
John W. Garvy, 3-story and cel brk flts, 50x42, Polk nr Lytle st	5,000
Wm. G. Hibbard, 3-story and bst brk dwllg, 27x76, 1826 Calumet ave; a, C. D. Frost	20,000
S. W. Rawson, 2-sty and cel and attic brk dwllg, 48x70, Ellis ave nr 50th st; a, A. M. F. Colton & Son	20,000
A. M. Graves, 2-sty brk dwllg, 28x52, 4526 Woodlawn ave; a, Moore	10,000
James O'Brien, 3-sty and cel brk flts, 23x60, 4228 Wabash ave	8,000
F. G. Otis, 2 3 and 2-sty and bst brk dwllgs, 40x40, 4430-32 Sidney ave	10,000
John Millet, 3-sty and bst brk flts, 22x64, 4336 Wabash ave; a, J. F. & J. P. Doerr	6,500
C. Waldo, 2 3-sty and bst brk flts, 50x53, 391-93 Bowen ave	8,000
Mrs. L. L. Tabor, 3-sty and bst brk flts, 25x60, 4317 Evans ave	10,000
H. J. Peck, 2 2-sty and bst frm dwllgs, 40x52, Alexander ave	8,000
Frank E. Turner, 5 4-sty and cel and attic brk strs and flts, 139x75,1254-58 N. Clark st; a, H. M. Hansen	70,000
F. Kownsky, 3-sty and cel brk str and flts, 24x65, 159 44th st	6,000

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☞Send for sample copy and circular letter.

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ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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THE demand for first-class plumbing is growing, and that class of work is being better appreciated. The work of the master plumbers is telling. They should feel gratified at the results of their efforts, and the people should feel grateful for healthier homes.

LET the plumbers of this country make a strong pull, a long pull, and a pull altogether for a great sanitary exhibit at the World's Fair. It is due not only to them that such an exhibit should be given, but it is due to the important sanitary interests of this country.

PLUMBING like medicine, the ministry or philanthrophy has a business end to it. Few people can afford to work for nothing, and some ministers labor for the salvation of souls at the rate of $25,000 per annum. Plumbers do claim such a sacred calling, and will labor for the salvation of lives and health for a much less per annum compensation.

THIS country can boast the best educational system of the world. It is right to develop mental strength, but health, the basis of all mental development, should not be neglected, and the public schools should contribute their share to the dissemination of hygienie lore.

DR. BILLINGS, in speaking with reference to Philadelphia, says that with a constant pure water supply, good sewerage, and clean and smooth streets, the annual death rate should not exceed eighteen a thousand, instead of 22.5, the rate for the past five years, which means that each year there were over 4,000 deaths and 7,000 constant cases of sickness. He therefore finds that about $1,500,000 was lost to the citizens in this way each year, estimating funeral expenses, medicines, attendance, etc., alone, without counting indirect damages due to the loss of labor. The doctor thinks that the reason why these reforms are not made, is because there is too much politics in the government of our cities; that those who seek to direct the cities' affairs are bent more on securing votes than on promoting the public welfare. It is a queer kind of a politician who seeks to make votes for himself by an increase of dirt, disorder and disease; yet we have just such men.

THERE often break into our State Legislatures by some means just enough smart blockheads to block legislation designed for the higher interests of mankind. They are not enlighted, not up with the times, and when a bill comes up for regulating plumbing are opposed to it, simply because they are too dull to comprehend the importance of it. They all want to be farmers, all laborers, all foreigners or all something which they think has votes attached to it. They want to truckle to some interest that is of the windy kind for them, and they are a botheration and a bane to the highest public wellbeing.

IF practical plumbers are not the proper persons to inspect plumbing, will some one please state who should be appointed to that position?

WHEN you employ a first-class tailor you expect to pay prices corresponding with good work. When you wish a first-class plumber don't expect to pay tinkers' prices. If you want a poor job done, pay poor prices and you can get it, but you will hate yourself for it.

WHEN the boards of health of our principal cities recognize the plumbers and their work as important factors in the general sanitation and health of communities, it is time for the public to pay some attention to the securement of the best plumbing.

THERE is a company known as the "Columbian Building Company" or some such name, which is associated with the Chicago Polytechnic Institute in the report that comes to us, which proposes a most dangerous method of building to public health. We do not presume that the company fully recognizes the seriousness and illegality of its scheme, or the extent to which its intended methods will menace public health. The dangerous portion of the method lies chiefly in plumbing. We understand that a class in plumbing is to be formed or is formed at the Polytechnic Institute, and that this class is to be given instructions in plumb-

ing by one who is to receive for his services "one-half of all tuition fees paid in by the students for his instruction, payable monthly as fast as taught, and *one-half of all the profits arising from plumbing contracts of which he has charge.*" The italicised words indicate that part of the scheme that is objectionable and in violation of law. It is designed to take out the pupils, unskilled boys, and put them to work on buildings erected by the Building Company. The evils arising from such work can be easily foretold, and its illegality is plain. We cannot believe that any one would venture upon such a scheme wilfully in violation of law, and against the highest interests of the public. The originators of this scheme are surely ignorant both of the law and the importance of plumbing. Such a plumbing school would prove a failure, as it would find no support among men whose support would be worth anything. And such plumbing is to be condemned from the start. We call the attention of the authorities to this that the law regarding plumbers and plumbing may be sustained, and that the evils arising from this class of plumbing may be averted. It is surprising that men would project such a scheme in the face of the law governing plumbing, and that they would not better inform themselves regarding the evils of poor plumbing. No plumbing school or class can prosper under these circumstances. It is bad for the pupils and bad for the public. If a plumbing class is to be started, let it be started right, and if plumbing is to be done, let it be done by men qualified to do it properly.

There are many plumbers who deserve membership in the Master Plumbers' Association who have not joined it. There may be good reasons for a reputable, well qualified plumber not to join this association, but there are many reasons why he should. In the first place he would encourage and assist in the advancement of a good cause, serve a high public interest, and to himself receive benefits he cannot find outside the association. The friendly aid such organizations extend to members would be his, and a membership in such an organization is to a great extent a general recommendation of his proficiency and guarantee of his qualifications as a member of the craft.

THE WORLD'S FAIR AND THE PLUMBERS.

In order to make anything a complete success, it is necessary to make a success of all its parts. If the different interests to be represented at the World's Fair be given a proper exhibit, with patient and faithful regard for each department, the whole will be successful and a credit to the great country under the auspices of which the exposition is given. The Columbian Exposition cannot be a thoroughly representative exhibition of the world's great interests unless each of these varied interests is given attention and display commensurate with its importance. The omission of any of these, or indifference to one of them, will lessen to that extent the total results and to that degree the exposition will be a failure.

There is one interest common to every individual in the world, and lies at the foundation of all industry and progress; that is healthful habitations. Make the habitations of man healthful, construct them in accordance with hygienic laws, and mankind will be healthful, vigorous, and prepared to advance more ably the world's great departments of industry. The home is the unit of measure of a people's strength. From sanitary and cheerful homes spring a nation's strength and hope. As the individual home is, so is the community, so is the nation. It would seem a farce to give a great exposition designed to represent the wealth, resources, and industries of the world, and neglect that department of science on whose existence rest the possibilities of human vigor, energy and activity which produce all things.

One of the most important agencies in the sanitation of the home is plumbing. It is so recognized by highest authorities boards of health, and municipal and state law. Should this agency not be adequately represented at the World's Fair, an opportunity to advance its interests and extend its wholesome lessons among the people will be lost never to be recovered. For this reason the importance of the occasion is apparent. For this reason the plumbers of the country should take active measures to secure for this department such a representation and exhibit as shall be worthy of the important interests involved. The management of the exposition should take immediate steps to give a sanitary exhibit that will fully represent the progress of this science and its practical worth. The hearty co-operation of the plumbers can be easily secured. As ever heretofore they now stand ready to give their valuable aid to all means that tend to promote the healthfulness of the home and the securement of hygienic conditions worthy of this great people.

We do not apprehend that this important feature will be overlooked, but there is danger of it not receiving that attention which its great importance demands. The work should begin now and be carried forward with energy, experience and intelligence. It cannot be made a success in indifferent or inexperienced hands. It needs and deserves the most careful attention and able direction, an intimate acquaintance with the vast interests to be represented and friendly relations with the manufacturers of sanitary appliances. Should but this one feature, plumbing, be represented, an astonishing exhibit could be made. The progress in this direction of the last decade has been marvelous, and a proper exhibit of plumbing supplies with their sanitary appliances and specialties would be a surprise to all who are not identified with this scientific and industrial progress. The same energy and progressiveness which have characterized the advancement of this interest would be displayed in an exhibit at the World's Fair should the opportunity be offered. The plumbing fraternity alone could make a display as interesting and valuable as any other that will be on exhibition. Shall not the opportunity be given? We wish to call the attention of the management to this important interest, and trust that the proper attention will be given the matter. Its omission will be a great mistake. Its representation will add to the exposition and serve to advance one of the most important interests of the country. It is too important to be neglected or for action to be longer delayed.

DISINFECTING PATROL.

The Health Department of Milwaukee, Wis., is preparing to put in operation a disinfecting patrol system. This, according to Dr. Farnham, is a preliminary disinfecting system by which is meant "a disinfection made at once on the report of any case of contagious disease. It consists of the renovation and the establishment of sanitary conditions in a house so far as disinfection will do it. It aims at striking at all sources of primary contagion and in the isolation, so far as is possible, of the patient afflicted with a contagious disease.

This will be accomplished by disinfecting all heaps of outside rubbish and the outhouses, by disinfecting the cellar and making it dry, by repairing leaks in sewer or water pipes, and by taking from the house and disinfecting in the van at the door all carriers of contagion such as clothing, curtains, carpets, etc. While this work is being done in the van, the clothing of any members of the family not affected by the disease may be attended to at the same time. The floors of the house will be washed and the walls, floors and furniture will be sprayed with anti-septic solutions. This done, the patient will be isolated.

It is believed that in the majority of cases this method will limit the disease to the person who has already become affected. The disinfection of the clothing of the other members of the family will largely prevent the spread of the disease by them. While no system of disinfection can perhaps be perfect without careful treatment and until people have been educated up to the use of hospitals for the treatment of contageous diseases, it is believed that this method will be the direct means of saving many lives and of greatly reducing the number of cases of diphtheria and scarlet fever.

This system of disinfection is to be carried out by the aid of a corps of three men, a van which will be a closed apartment on wheels that can be easily drawn by one horse, and a light wagon to carry chemicals and apparatus to be used in disinfecting. The chemical wagon will be provided with a stretcher so that, in case of emergency, it can be used as an ambulance.

The value of such a system of disinfection is readily understood. It has worked well in many places in England, and there is not a city of any size in this country but what should be similarly equipped. The prevention of disease means its immediate prevention, and this is one of the means to that end. It should be employed further, and Dr. Farnham and Commissioner Wingate deserve praise for establishing this system in their city.

NOTES AND NEWS.

It is stated that a Vienna doctor has declared that cancer can be arrested, if not cured, by an injection of the dye methy violet.

Three hundred to 400 tons of coal per day is the amount used in some of the large passenger steamers on the Atlantic. This is about one ton per mile run.

It is proposed to utilize sewage sludge for the manufacture of cement in the United States, yet there appears to be a good demand for Portland and other qualities.

It will be news to many to learn that when asafœtida is distilled *in vacuo*, one of the products is of exceedingly pleasant odor. So at least a German chemist announces.

A certain amount of air admitted to the furnace above the live coal is advantageous rather than otherwise if the supply be regulated. The oxygen of the air thus introduced assists in the more effective combustion of the gases.

An International Exhibition is to be held at San Paulo, Brazil, in January, 1892. Full particulars can be obtained by intending exhibitors by applying to the Secretary of the French Chamber of Commerce at Rio de Janeiro, Brazil.

A recent novelty in electrical appliances is a handy incandescent drop light in which the current is switched off or on by pulling the flexible cord that supports the lamp, instead of by turning a key in the lamp socket. The switch is at the ceiling and the flexible conductor is fastened to the handle of the switch, which moves on the slightest pressure. A single pull lights the lamp, and a second pull extinguishes it. It is not altogether desirable that the slender conductor should always be charged, and this device very simply obviates this objection.

The Council of the Society of Arts, acting under the provisions of the Benjamin Shaw trust, have offered two gold medals, or two prizes of £20 each, to the executive committee of the Congress of Hygiene and Demography for any inventions or discoveries of date subsequent to 1885, exhibited at or submitted to the congress, and coming within the terms of the trust. Under the conditions laid down by the donor, these prizes are to be offered for new methods of obviating or diminishing risks incidental to industrial occupations.

Through experiments made by English military authorities it has been found that whenever the atmosphere is laden with smoke or mist the power of an electric light is greatly diminished by crossing the beam of light by that of another at a certain angle. At the point of intersection the illuminated space is practically made a screen. It is proposed to utilize this knowledge, since the electric beam, can thus be made to serve as a screen, back of which tactical operations might be conducted in secret.

A process has been recently invented by which iron may be coppered by dipping it into melted copper, the surface of the iron being protected by a layer of melted cryolite and phosphatic acid. It has been found that if the article when immersed is connected with the negative pole of a battery the coppering is done more rapidly.

Liquid chlorine is, according to *The* (London) *Gas World*, now supplied as an article of commerce by the Badische Anilin und Soda Fabrik, Ludwigshafen, on the Rhine. Herr Knietsch has been investigating its physical properties. In thick layers it is orange yellow; in thin, yellow. It completely absorbs blue and violet rays, allowing red, orange, yellow, and green to pass.

A german inventor has devised a new material which is intended as a substitute for leather in many of its uses. This material consists of panels of wood with wire netting between, the whole being glued together under heavy pressure. The sheets thus made are said to be very tough and pliable, and suited for making trunks and other uses that require strength.

A method for testing the hardness of iron and steel while in the process of manufacture has been invented by Mr. C. A. Caspersson, Forsbacka Ironworks, Margretshill, Sweden. The inventor, it is said, conducts a current of electricity through a test piece of iron or steel, letting it melt the same, upon which the strength of the current necessitated in the operation is compared with the strength of current required for the fusion of a standard piece of metal of determined degree of hardness, and of the same diameter as the piece to be tested. The hardest piece will resist longest, but melt if the current be maintained sufficiently. By the aid of an ampere meter, metals of varying hardness may be tabulated, so as to furnish a scale, it is said, of hardness.

SEWERAGE AND THE DISPOSAL OF SEWAGE.

The following is the report of Peter D. Keyser, M. D., made to the Mayor of the city of Philadelphia regarding the sewerage and disposal of sewage of several European cities, the inspection of which was made in Dr. Keyser's official capacity as a member of the Board of Health:

As suggested by you, that while I was in Europe this summer attending the Tenth International Medical Congress held in Berlin, I should go in my official capacity as a member of the Board of Health, and look into the subject of the disposal of sewage, cesspool matter and garbage, which is becoming such an important question now in this city, I have the honor to report that no my arrival in the above named city I called upon Her von Forkenbeck, the Oberburgermeister and presented your official letter of introduction as well as one which Mr. Chas. H. Meyer, Imperial German Consul in this city, very kindly gave me to him. I was very kindly and politely received and every courtesy and facility rendered me to favor my study of the system of sewerage, etc., in that great city. Her von Forkenbeck handed me to the personal charge of Herr Marggraff, Stadtrath, who gave me a pass to all of the departments I desired to inspect.

I found in Berlin a complete set of sewers running through the city, which, uniting in larger ones called conductors, carry the great mass of sewage to the places of deposit, where machinery is erected to pump it out, as the river Spree, which is a small sluggish stream running to the city, cannot be used as a receptacle or dumping place for anything. Nothing but surface water, waste from yards, kitchen and water closets is permitted to run into the sewers. Even to prevent the great quantity of the dirt from the ordinary dropping of the horses and wear and tear of the *streets*, men are continually employed gathering such waste together and depositing it in ornamental iron receptacles, which are to be seen in every square, from whence it is removed at night by carts. No bits of paper, garbage or debris of any kind are suffered to be thrown into the streets. These are collected in bags or boxes and hauled out of the city for whatever use they can be put to. Everything, more or less, is put to some use in one way or the other. Waste as in this country is really unknown. All of the sewage matter is used for cultivation around the city. Berlin was founded on a barren sand plain and for a long time all the fruits and vegetables were brought into the city from distant parts of the country. But since the utilization of sewage matter the surroundings of Berlin have become magnificent fertile tracts, developing gardens producing almost everything necessary in the way of food for the inhabitants.

To make this sewage useful, sewers were built in every street, large and small, according to the character of the street, and uniting into a system which carries the matter into large places or basins from which it is pumped up to give it flow into other canals or sewers running out into the country. As the whole territory around is very flat, it is necessary to have stations for pumping the water up to get the required elevation to give the further flow to extend to certain distances. From these stations it runs into many canals, which are connected and can be shut off as needed. The smaller canals run throughout the country, irrigating the soil and permitting the deposit of the solid matter as it runs along. This solid matter is at times scraped out of the canals and thrown on the land, making very fertile soil.

From Berlin I went to Dresden, which I found a very clean city, with a system of sewers not as thorough, but sufficient to relieve that city for its present needs. The river Elbe running through the city, dividing the old from the new parts, is a large, swift-flowing stream, in which the sewers empty, and everything is carried down in the rapid flow.

I next visited Frankfurt-on-the-Main, a large, improving city, and through the kindness of my friends, Mr. Franz Brofft and Mr. Jacob Klein, who accompanied me, I was able to make a careful examination of a new system adopted in that city only a few years.

The country around the City of Frankfurt is so good for all

character of cultivation that it is not needed to irrigate with the water from the sewers, and here is found a different system for the disposal of the sewage.

There is the same arrangement as to the cleanliness of the streets as is found in all the cities in Germany, and nothing but the surface water and that coming from the kitchens, yards, and water-closets passes into the sewers. There is a regular system of sewers, small and large, running throughout the city, and all make final connection into a large one which runs along the river front and down below the city a distance, when it dips under the river, crossing over to the other side to a large works called Klarbecken Anlage (works of the settling basins). As this large sewer reaches the left bank of the river it is met by one coming from Sachsenhausen, an old town which is now part of Frankfurt, but on the opposite side of the river. These settling basins are made quite deep under the ground, so as to get the proper fall for the sewer water to run into them. As the water, which comes with quite a force, enters the works it runs over grates or sieves to catch the larger particles of stuff that may be carried along the stream. These large particles are shoveled off by men constantly, day and night, and hoisted up to the surface and deposited in a place therefor, from whence it is sold and hauled away. Destructible matter which would decompose is burned. After passing over the grates the water runs into the settling basins, which are six meters wide at the top, 5.4 meters at the bottom, and 82.4 meters long. At the entrance two meters, and exit three meters deep. There are two sets or series of these basins with six in each, making twelve in all. Each basin has the capacity of 1,100 cubic meters, so that the water in each remains six hours. The rapidity of flow is equal to five in and three out, at and average of four m. m. per second. Each group is calculated to receive a normal flow up to 20,000 cubic meters, and in stormy weather a flow up to 40,000 cubic meters per day. The whole works are arranged for 40,000 to 80,000 cubic meters per day. These basins are covered with arches of brick, with many large air-holes to admit light and air. To destroy any odor or deleterious action of the water an arrangement is made to mix two solutions—one, sulphate of thonerde (clay), the other (lime),—with it, just as it is about going into the basins, These solutions are made by machinery and run through tubes with many holes, and are placed just over the duct as the sewer water comes through the sieve to the settling basins. These mixtures destroy all deleterious matter and action and cause the solid matter to settle by the time the lower end of the basin is reached in the regular course of the flow. At the lower end of each basin is a large gate, which can be raised when necessary to cleanse or make repairs. These gates are kept closed and the water passing over is perfectly clear and is run into the river Main. The slimy settling from the water flows to the lower part of the basin and is pumped out by steam machinery and deposited in spaces or vats made for it just beyond the works. From here it is taken away free of expense by the farmers in the neighborhood, who come for it in wagons, or ship it in boats up and down the river to more distant places.

In connection with the sewers there are in different parts of the city, high, beautifully-built ventilation towers, which carry off all the gases so that nothing rises up from the openings in the street. These towers are very ornamental and not in the least objectionable.

From Frankfurt I went to Paris, where I called on M. Poubelle, the *Prefet de la Seine*, with your letter and one from Mr. L. Vossion, French Consul in this city. Monsieur Poubelle being at the time out of the city, Mons. Laurenceau, his Secretary General, received me very kindly and tendered me all the facilities necessary for my inspection of their works. He went with me to the several Bureaus to make the arrangements, and have gentlemen to accompany me through the departments I desired to visit. An employee of the Bureau and a carriage were placed at my disposal daily.

In Paris there is a complete systems of sewers, large and small, and only surface water with that from the yards, kitchens and water closets is permitted to flow in to them. At one time the sewers emptied into the river Seine, which divides the city, but these outlets are now all cut off by large sewers called conductors, which convey the contents to the outer parts of the city for utilization in irrigating and cultivating the surrounding country. The whole system is a perfect one and of much benefit in the production of fine fruits, vegetables and flowers.

In the collecting and removal of cesspool matter there are at present four systems: the permanent, the movable, the filter and the sewers.

The permanent is the oldest method, which consists of a large cesspool in the court yard of each house into which the water closets drain, and when the pool is nearly full its contents are pumped out at night and carried away. This system, although not introduced into any houses the past two years, is still the most in use, there being 64,700 such pools in the city. The cleansing of these is done by steam pumps in charge of a company, who take the matter out to dumps in the country where they have factories to manufacture sulphate of ammonia by distilling the liquid after the separation of the solid and making poudrette from the latter. In the outskirts of the city the cleansing of the sinks is still done by old hand pumps.

The movable system is that of receptacles like barrels, crocks, etc., with covers, which are stood in the closets on the different floors of the houses and removed when full. This removal is done in the day time. They are cumbersome and very unhealthy. The use of such receptacles is decreasing very fast. There are 17,700 in use.

The filter system is much used, there being 33,800 in existence. This is composed of a cistern of masonry having a filter pipe running into the sewer. In the centre of this cistern stands a tub into which the pipes from the closets open. The solid matter flowing into this tub settles therein, while the liquid flows over into the surrounding cistern, to pass out through the filters into the sewer. It is the purpose to clean the inside tub when full before any of the solid matter contained therein can run over into the cistern and block up the filters. But this is not always attended to in time, and when an overflow occurs the whole affair becomes a filthy, dirty place, and, becoming infectious, is a great source of disease. To get rid of all such infectious spots, a law was passed in 1886 requiring all closets and slop drains to be connected directly with the sewer.

The sewer system is well known and similar to that used here in this city, except in the sizes and shapes; the only difference being in that which is permitted to flow therein. Great care is taken that no solid particles, such as vegetables, papers, etc., are permitted to be thrown down the inlets nor into the streets. Any one throwing such into the street is obliged by the police to pick them up at once and carry them away.

The sewage water is carried to the outskirts of the city in different directions to stations, where it passes over iron gratings or sieves to separate the larger particles that may unavoidably get in, and runs into a reservoir, from which it is pumped up into another reservoir, raised ten or twelve feet above the snrface of the ground, to give it fall enough to cause it to run into and through many ditches in the land to be irrigated. The openings in these elevated reservoirs are in the bottom, so that the settlings can run out with the flow. This system is an excellent one, and is of great utility to the surrounding country. The final running of the water from these irrigating ditches is perfectly clear and pure (by chemical tests made continually on the spot) and runs into the river.

In passing through the sewers I was surprised at the loss of odor. Nothing unpleasant was found.

The sewers are constantly flushed by letting water run in the different streets daily at stated times. This is nicely done by an arrrangement much better than our unsightly fire-plugs, and the stream is not thrown out into the streets, but only in the gutter, where the hydrant or plug is situated.

In reviewing the different methods as to their utility and adoption for this city, I must say that the surroundings of Philadelphia are such that the system in use in Berlin and Paris could not be applied here. There are no sandy or unfertile lands in the neighborhood which could be irrigated, and only in New Jersey, on the opposite side of the Delaware river, can such be found, but too far to be reached, and even to do so it would necessitate the passing under the river, which is impracticable. It, therefore, narrows down to the one system—that of Frankfurt-on-the-Main. This, with perhaps some modifications, might be used with great benefit to this city in the air and water. A large conducting

sewer could be laid down along the whole length of the Delaware river front to the lower part of the city, called the "Neck," where settling basins could be placed. All the sewers of the eastern part of the city could empty into this large conductor. Another such conductor could be laid along the eastern bank of the Schuylkill river, running also to the "Neck," which would collect from the sewers running towards that river. For the draining of West Philadelphia a conductor could be laid along the western bank of the river to run to another set of settling basins, or, by dipping under the bed of the river, cross to the set receiving from the other two conductors. A large plant could be put in the "Neck" to do, I think, all the work. In this way the drainage would be complete, and nothing run into the river but the clear overflow of water from the basins. The solid matter pumped or taken out can be used for fertilizer or burnt in a crematory built for the purpose without emitting any unpleasant odor.

As something will have to be done with the great amount of garbage and general refuse matter, it can be collected and cremated in the same furnaces. This is, I think, the best method that could be adopted to get rid of these dangerous and pestilential products.

While upon this subject permit me to call your attention to necessity of larger and improved sewers—see accompanying pamphlet on the sewers of Paris. The sewers in the large streets should be large enough to allow the water and gas pipes as well as telegraph, telephone and electric light wires to be hung therein and to be easily gotten at for repairs and attachments, thus saving the great inconvenience in tearing up the streets so frequently. The city is now so large and the population so great that provision should be made for the great increase in sewage flow. In building and repairing sewers the necessities for the present should not alone be thought of, but the far future should be taken in account so as to be prepared for the constant growth of the city.

I would also call your attention to the advisability of the removal of the old and unsightly fire plugs in the streets and the substitution, especially in the more prominent streets, of the system in use in Paris, where the water supply for fires and streets is below the pavement, and covered with an iron plate easily removed when necessary. This would also prevent the freezing in winter time.

The inlets from the streets into the sewers could be improved by having smaller openings and more of them in each square, and remove the ugly gaps at each corner of the streets, large enough to permit a good-sized child to roll down, or any larger substance or matter to be surreptitiously thrown in. With these several changes gradually introduced, the city would be improved in every way.

SOME WAYS OF PRESERVING HEALTH.

One of the best ways to keep in good health, says the *Monthly Bulletin*, is not to think or worry too much about it. If you feel strong and well, don't imagine that some insidious disease may be secretly attacking your constitution. Many people are like the inexperienced traveller, who anxiously inquired about the symptoms of seasickness, and how he should know when he had it. One generally knows when he is sick, and frequently many supposably alarming symptoms prove, upon investigation, to be either perfectly natural occurrences or of very slight importance.

Eat and drink what you desire, as long as it agrees with you. Your stomach knows pretty well what it can digest. Plain, simple food is desirable, as a general thing, but the luxuries of the table, in moderation, will do no harm.

Alcoholic beverages are not fit for habitual use. They are true medicines, and should only be used like any other medicines—under the advice of a physician. As a regular beverage they can do no good, but will almost certainly do harm.

Take all the sleep you can get, but remember that the necessary amount varies greatly for different persons. Some must sleep at least nine hours, while others thrive under six. Only don't rob yourself of what you really need. The "midnight oil" is a terribly expensive illuminant to burn either for purposes of labor or study.

Always treat a common cold with great respect. Ninety-nine times out of a hundred it will get well anyway, but the hundreth cold, if neglected, may lead to bronchitis, pneumonia, or consumption. It is best to take no such chances.

If you are sick enough to need any medicine at all, beyond the simple remedies familiar to all, you are sick enough to need the attendance of a physician.

By all means take as much exercise as you can, and be in the open air as much as possible. Out-door life is the natural condition of mankind, and the more one can have of it the better. The practice must not be carried to extremes, however. There are many days when one is much better off in a warm, comfortable, well-ventilated house than trying to take out-door exercise in a mid-winter storm, or under a July sun, and no one ever strengthened his constitution by sleeping with his bed-room window open, with the outside temperature at zero, or allowing the snow to drift in upon his pillow.

Fresh air, sunlight, good and sufficient food, pure water, out-door exercise, temperance in all things, and a cheerful disposition, are the chief remedies in nature's dispensatory, and are worth more than all the drugs and medicines of the shops. Dr. Holmes has truly said that if nine-tenths of all the medicines, patent, proprietary and otherwise, in the world were poured into the ocean, it would be all the better for mankind and all the worse for the fishes; and the best physician can do little without good nursing, and thus aid nature in throwing off disease.

CONVENIENT TO HAVE ABOUT.

By the application of chloride of antimony a beautiful violet color is imparted to brass work. The brass should be first made perfectly clean, and heated until the water will steam off it without hissing.

A Worcester (Mass.) mechanic gives the following method of hardening any tool, which he has employed for some years: Forge the tool into shape, then melt in a dish sufficient Babbitt metal to cover the end of the tool as far as it is wished to harden it. Thrust the tool into the metal and let it cool. This will render any tool much harder than when cooled in oil or tempered by any other process.

Lacquer made a shellac and colored with dragon's blood or turmeric makes of good gilt lacquer for polished brass work.

Tracing paper.—First treat the paper with boiled linseed oil, and remove the excess of oil with benzine. Washing the paper with chlorine water, followed by a solution of binoxide of hydrogen, will greatly improve it.

To detect alum in bread, an exchange says: "macerate in three or four tablespoonfuls of water a half slice of bread. Strain off the water, and add to it twenty drops of a strong solution of logwood. Then add a large teaspoonful of a strong solution of carbonate of ammonioum. If alum be present, the mixture will be changed from pink to a lavender-blue. This test will discover a grain of alum in a pound of bread.

The nitrate of lead is the cheapest disinfectant known that fufills its intent. It is made by dissolving half a drachm of nitrate of lead in a pint of boiling water, then dissolve two drachms of common salt in eight or ten quarts of water. When both are thoroughly dissolved pour the two mixtures together, and when the sediment has settled you have a pail of clear fluid which is the saturated solution of the chloride of lead. A pound of nitrate will make several barrels of the liquid.

A simple and economical way of tarring sheet iron pipes to keep them from rusting, is as follows: The sections as made should be coated with coal tar and then filled with light wood shavings, and the latter set on fire. It is declared that the effect of this treatment will be to render the iron practically proof against rust for an indefinite period, rendering future painting unnecessary.

The proportions of lead and tin in solders vary with respect to the heat to which the soldered joint is likely to be exposed. Coarse solder is generally composed of three parts of lead and one part of tin; this melts at 480 degs. Fahr.; plumber's solder composed of two parts of lead and one of tin, melts at 440 degs.; and fine solder, made of equal parts of lead and tin, fuses at 370 degs. The melting point of lead is 612 degs.

Very few chandeliers are gilt; they are burnished and lacquered with yellow lacquer. Take the chandelier to pieces, and boil in strong soda lye for a few minutes; brush over with a soft brush, pass through a strong solution of potassium cyanide (a deadly poison), wash through a tubful of boiling water, dry in clean sawdust, wipe up bright with a washleather, and re-lacquer. A pale gold lacquer may be made of one gallon of methylic alcohol, ten ounces of seed lac bruised, and half an ounce of red sanders dissolved and strained.

INVENTOR'S NATIONAL ASSOCIATION.

The principal benefit resulting from the Patent Centennial Celebration just held at Washington, D. C., was the formation of a National Association of Inventors and Manufacturers. This will, without doubt, prove one of the most important events of the nineteenth century, and of vital interest to the inventors and manufacturers of this country. The most perfect harmony and good feeling pervaded all the business sessions, and the National Association was formed without class or sectional jealousy.

The election of officers and directors for the ensuing year resulted as follows: For President, Dr. R. J. Gatling, of Hartford, Conn., the inventor of the celebrated gun which bears his name, and which brought him large remuneration and great fame, as well as distinction to our country as the producer of the most powerful projecting gun in the world. The four Vice-Presidents are Dr. Gardner G. Hubbard, of Washington, D. C., an inventor, and the father-in-law of Hon. Alexander Graham Bell, inventor of the telephone; Prof. William A. Anthony, President of the American Institute of Electrical Engineers; Thomas Shaw, Esq., Philadelphia, inventor and extensive manufacturer, and patentee of 110 inventions, and Hon. Benjamin Butterworth, Ohio, former Commissioner of Patents, ex-Chairman of the House Committee on Patents, and now Secretary of the Columbian Exposition. The selection of Prof. J. Elfreth Watkins, Curator at the National Museum, as Secretary, met with unanimous approval, and was a most excellent choice, as is attested by the success of his untiring efforts during the last four months as Secretary of the Patent Centennial. Mr. M. C. Stone, of Washington, an inventor and enterprising manufacturer, was elected Treasurer. The Board of Directors is composed of the following gentlemen: John Wise Smith, Esq., engineer, Pennsylvania; David G. Weems, Esq., electrical railway engineer, Maryland; Prof. R. H. Thurston, of Cornell University, New York; Chas. F. Brush, Esq., inventor and manufacturer of electric lighting apparatus, Ohio; Prof. Otis T. Mason, Curatur, National Museum, Washington, D. C., Hon. David M. Smith, manufacturer of sewing machines, New Hampshire; F. E. Sickels, inventor of the first steam steering machinery, Kansas City, Missouri; Oberlin Smith, Esq., manufacturer, New Jersey, and R. S. Munger, Esq., manufacturer of cotton machinery, Alabama. In addition to the regular officers and board of directors, there will be representatives in every state, some of which have already been appointed. At an informal meeting it was suggested that there be a committee of seven on Legislation to advance the interests of the Patent System before Congress and guard against any encroachment upon the rights of inventors and manufacturers.

The constitution and by-laws, with particulars as to eligibility to membership, will be ready for distribution in a very short time. The annual dues for active membership will probably be fixed at $5, and life membership $100. Provision is also made for associate and honorary members. There will be an annual meeting of all the members, at such place as may be determined upon. It is believed that the results secured by the formation of this National Association for the mutual benefit and protection of inventors and manufacturers and the perfecting of the American Patent System will be far-reaching. Every inventor and manufacturer of this country ought to be a member of the association.

Lack of space prevents an account of the eloquent and magnificent addresses, but, as they are to be printed and bound in book form, those who could not attend the Centennial celebration will have the privilege of reading them. The highest tribute was paid to the inventor as the greatest and noblest benefactor of mankind. He needs no monument, for his works are a living monument of his toil and ingenuity.

Edward T. Fenwick.

PLUMBING WORK AND LICENSED PLUMBERS.

In the following article Leonard D. Hosford discusses in the *Architect and Builder* a state of affairs which will apply to other cities besides New York:

Much has been said in approbation of the plumbing laws of New York City, and the admirable display of executive ability shown in the prosecution of their work by officers and attaches in the Bureau of Plumbing Inspection of the Health Department.

Such a condition of affairs must certainly be productive of some good, and an inspection of a New York City dwelling plumbed in 1880 compared with one plumbed within the last two years will show at once, both in principle of construction and character of workmanship, that our Health Department has made rapid strides in the interests of house sanitation.

Let us, however, proceed with the burial of Cæsar, rather than extemporize.

The heading of this article implies that plumbing work is being done in this city by unlicensed plumbers, and that such work is not subject to health inspection, as many suppose it is. This is exactly the status of affairs, and it means that such work is as liable to be constructed defectively as it is correctly, and perhaps more likely the former than otherwise, if the past record of the plumbing trade (taken as a whole) counts for anything. The writer has no accurate knowledge of the total annual amount of this class of work, but it certainly mounts up into the hundreds of thousands of dollars.

Your correspondent personally, in one year, constructed work to the extent in value upwards of $15,000, in jobs ranging from $2,000 to $5,000 each, where no plumbing inspector ever darkened the door. An inspection once being invited, he was informed that this work did not come within the jurisdiction of the Health Department, although it consisted in plumbing the building in question from the street sewer to the attic slop sink, with all intervening appurtenances.

The work above referred to was in some of the finest of Fifth avenue residences which, having been built several years, the replumbing of the same did not come within the limits of the law governing the erection of plumbing.

Consider the consistency, or rather the inconsistency of a law which will allow one man to construct the plumbing of a dwelling without any inspection, test or approval from authorities, and, if it is desirable, he may employ an unlicensed and unregistered tinsmith, if you will; while the man who erects a building next door must so construct his plumbing that it will bear innumerable inspections and tests at the hands of our zealous plumbing inspectors.

It has been argued that a law compelling a man to plumb an old building in the same manner as the law now requires him to plumb a new one, would be retro-active in spirit and, therefore, illegal. It will be seen, upon consideration, however, that such is not the case; for, when he is about to remodel, he should certainly comply with the most approved custom and law, providing such custom and law be founded on merit. Let us, therefore, either acknowledge the defect in the present approved method of plumbing or compel *all* construction to meet the requirements.

The Plumbing Law of 1884, which calls upon all men engaged in the plumbing business to appear at the Health Department before a certain date and register their names, is now and always has been a dead letter. No successful and systematic attempt has ever been made by the health authorities to enforce this law, and it would be utterly useless if such ends were attained, as the law does not say that a hatter, tailor or bookbinder may not register and carry on the plumbing business, and the unsupported statement of the applicant for registration is accepted, without even the formality of an oath, and if he does not choose to register at all, he may conduct the plumbing business just the same.

It will be observed, therefore, that only a portion of the plumbing work constructed in this city is subject to health inspection, and that only a portion of the plumbers who do this work are registered and licensed, and that when four men are selected to estimate in competition on the reconstruction of an old house, they do so with an absolute knowledge of the fact that there will be no health examination, test or inspection, and they estimate accordingly; the one who estimates to do the least usually has a low estimate. What protection does the Health Department give in

this instance to the property holder? Absolutely none! He is at the mercy, for aught he may know, of an unlicensed and unregistered plumber, and defects may exist, and the sewage of the house may be vomiting its gases into his sleeping apartments until the health of his family indicate dangerous surroundings, before other discovery is made of the existing evil.

Judging from the "License Register" and the "City Directory," there are at least four hundred unlicensed and thereby disqualified plumbers in the City of New York, conducting the plumbing business to-day. What knowledge has any one that his work is not being done by one of this class.

To cite an instance: a certain stove dealer, not a mile from the City Hall, finding business dull, hung out the sign "Sanitary Engineer," and purchasing a coil of pipe and a piece of broken crockery, started the plumbing business, and is to-day doing more or less work in this line. While if a butcher was to attempt to practice surgery in this city, he would soon find himself in historic Ludlow Street Jail. If one is a crime, is not the other a greater? If the community has decided that in order to protect life and health, it is necessary to maintain a Bureau of Plumbing Inspection, should twenty-five per cent. of the plumbing work erected be allowed to go free? And if it is a health measure that our city requires a professor of medicine to have a certain knowledge and a diploma before he can legally conduct business, should the itinerant, irresponsible, unlicensed, unregistered, self-styled sanitary engineer, be allowed to practice at the possible expense of human life?

In brief, if there is anything in this scheme of licensing, registration and health inspection, let us have it all.

A greater mind has said that "'Tis easier to find a fault than suggest a remedy."

Relief, however, in this case, is easily obtained in an amendment to our present health law, and a bill embodying these changes should be drafted and presented to our State Legislature without delay.

1st. That a Board of Examiners should be appointed, consisting of men thoroughly conversant with the art of plumbing.

2d. That all men engaged or engaging in the plumbing business should prove to this Board their sufficient qualifications to enable them to conduct the plumbing business, and that upon such proof they should be entitled to a numbered certificate of license, which number should be displayed over their door of business.

3d. That plumbers should make returns to health authorities, filing a periodical schedule of all work performed.

4th. That all plumbing work, old and new, shall be inspected by Health Inspectors who shall themselves have qualified as to their ability, and be, if necessary, under bonds.

5th. That the law prescribe a forfeit penalty or imprisonment, or both, for non compliance.

The protection to the property holder is seen here at a glance. The sign of "Licensed Plumber" with number of license attached, and the obligatory display of same over the door of every plumbing establishment in the city, assures the property holder to the same degree that a physician's diploma does the patient, viz., that this man is qualified to conduct the business.

The health of this great municipality demands such a law, and demands that it be enforced, and it is to be hoped ere long that she will enjoy the advantage of it.

FOR SANITARY PROGRESS.

The following communications mean business and explain themselves:

Office of Sanitary Committee of the National Association of Master Plumbers, 8 North Avenue, PLAINFIELD, N. J., April 1, 1891. DEAR SIR:—Having been called to the above responsible position at the last Annual Convention of the Master Plumbers of the United States, it becomes our duty to take prompt and energetic measures to show the public that the plumbers are alive to the requirements of the times, and are willing to do their part towards the advancement of sanitation.

The day for idle protests has passed, and as we are socially connected and interested with the National Board of Health and desire to show that we mean business, let us see if something practical cannot be done which will show that the plumbers are earnest, determined and honest for sanitary reform; we want facts, figures and information from every part of the country regarding the health laws and sanitary condition of our cities and towns, with suggestions and advice regarding the best means of improving the plumbing, drainage, ventilation and sewerage system as now existing.

Looking for prompt responses and hearty co-operation, we enclose blank which please fill out with such facts, etc., as come within your knowledge.

Fraternally yours,

D. W. LITTLE, Chairman,
JOS. F. BLACKSHAW,
CHAS. SPITTLEHOUSE,
JOS. BUDD,
G. B. KING,
National Sanitary Committee.

Chairman's address; 8 North Avenue, Plainfield, N. J.

Office of the Sanitary Board.
City of.....
State of.....

Dear Sir:—Having received your enclosed communication from the National Sanitary Committee of the Master Plumbers' Association of the United States, we are pleased to fill out the following reports:

System of sewerage.
System of drainage.
System of water supply.
System of ventilation.
Style of water closet mostly used, earthen or iron.
If vented, how?
Style of traps mostly use.
If vented, how?
Have you rigid sanitary laws now in force?
Do your laws compel plumbers to do first-class sanitary plumbing?
Are all plumbers in your city licensed?
Is everybody allowed to do plumbing?
Do you enforce your sanitary laws?
What is your proportion of death rate and causes of same?
Please send us a copy of your sanitary laws.
Name of president.
Profession or occupation.
Name of Chief Inspector.
Profession or occupation.

HEATING.

NILES, Mich., April 27, 1891.—Editor of THE SANITARY NEWS: THE SANITARY NEWS of the 25th quotes: "All steam boilers are furnished with automatic damper regulators which effectually control the temperature." This statement is misleading. The apparatus controls the pressure only and leaves the radiators just as hot in moderate weather as in the coldest weather. By using a thermostat damper regulator, in connection with a magazine boiler, hot-water heating can be made so nearly automatic that all the attention ordinarily required to maintain a temperature that will not vary more than a couple of degrees during the 24 hours is to simply put coal in the magazine, generally once a day, and shake out ashes morning and evening. With the same apparatus it is an easy matter in spring and fall, by a little attention once a day or every other day, to run for days at a time with a temperature of only 80 degrees or less within the boiler. For steady and economical heating and little trouble, hot water has no superior, but where it is desired to warm up a room quickly or only occasionally it is too slow. W. G. BLISH.

SEWER GAS.

CLEVELAND, O., April 27, 1891. Why does not sewer gas effect the plumber? is a question that is very often asked and which is very easy answered. If one should sleep out of doors nights, he would "catch" cold, and by continuing the same he would soon run into consumption; but he might work out doors for years and never be effected, for the reason that he would be exercising himself enough to throw of the night dampness of the air. The same is true with a person sleeping in a room where there is sewer gas escaping. He inhales the gas, and having no

exercise, he retains the impurities of the gas, and the consequence is that he is soon taken down with some contagious disease. It occurs to me that this is the reason why the plumber escapes those diseases—on account of exercising himself while he is inhaling the gas; but should he work in it all day and sleep in it all night, he would be effected the same as others. This is my idea. I am no doctor, but it seems very plausible to me that if there are germs of disease in sewer gas, as the highest authority we have claimed, then we should exercise good judgment and see that no sewer gas escapes. If it has already escaped and you are down sick, send for a doctor and after that get a good plumber and let him remove the cause and the doctor will soon cure you; but as long as the cause exists the doctor will have hard work to pull you through. It is my opinion that a doctor very often loses a patient on account of not being able to locate the cause and not having it removed. It is pretty hard to cnre one that has taken poison if he keeps on taking more. W. A. Kelly.

DETERIORATION OF WATER IN RESERVOIRS AND CONDUITS.

At a recent meeting of the New Jersey Sanitary Association, Mr. C. B. Brush dealt with the above subject in a paper. He remarked that all water supplies are better at certain periods of the year than at others. In the hot, dry days the water becomes dead and lifeless; and if allowed to remain at rest for any considerable length of time, algæ formations appear on the surface. These, however, are destroyed and disappear as soon as the water is put in motion. If allowed to remain, the water cures itself—the algæ disappearing after a few weeks, and leaving the water again in its normal condition. The algæ show themselves more quickly on water that has been filtered, either naturally or artificially. The author also stated that water is delivered in its best condition when taken from a running stream and supplied directly to consumers without coming to rest during its passage. Water discolored by sediment is very often in its best condition, because the sediment is due to the fact that an abnormal volume of water is blown off from the watersheds, and any pollution there may be is so diluted as to be incapable of harm. But there is such a demand for clear water that reservoirs are necessitated, with their attending evils. Water that is stored for twenty or thirty days commences to deteriorate. This is due to stagnation; and the stagnation begins to manifest itself as soon as the oxygen in solution in the water becomes less than 0.3 per cent. The best means of preventing stagnation consists in keeping the water in motion; and there is no better way than forcing air into the bottom of the reservoir, and keeping the water aerated. Mr. Brush gave an interesting account of his experience with a number of reservoirs where the water had become tainted in consequence of lying stagnant; and in every instance he obviated the difficulty by forcing air into the reservoir or the mains.

THE BLAME FOR DIRTY STREETS.

A walk in the principal streets and avenues from seven to nine o'clock in the morning will convince the observer that, whatever the shortcomings of the Street-cleaning Department, storekeepers and housekeepers are primarily and incidentally responsible for dirty streets by allowing their employes to sweep into the streets the dust of their houses or stores, and the dirt and refuse found upon the sidewalk. If the walk is extended to the tenement-house districts at any hour of the day, it will be noticed that it is quite the custom to throw ashes and garbage into the streets, and to allow these materials to escape into the street or upon the sidewalk from insufficient, improper, or overflowing receptacles. It will also be noticed that, soon after a street has been cleaned, it is again defiled by the refuse and garbage from the neighboring buildings, and that the carts which transport street dirt, ashes, and garbage, sand for new buildings, earth from cellar excavations, and the dust and dirt from buildings torn down, scatter some part of their contents into the street as they proceed to their destination. A student of the problem of street-cleaning has only to make the above observations to learn the primary cause of dirty streets in New York, and that, without a thorough reform in this particular, relief is well-nigh hopeless. This simple solution of the problem is only the application to the streets of the familiar rules which govern every well-regulated household. Can a house be clean if the members of the family throw waste paper and other refuse on the floors, and ignore the waste-basket and the cuspidore; and how many times a day must the floors of the house be swept, if such a practice is tolerated.—*From Street-cleaning in Large Cities, by* General Emmons Clark, *in The Popular Science Monthly for April.*

PLUMBING NOTES.

By a unanimous vote the following resolution was adopted at a meeting of the Chicago Master Plumber's Association held April 23:

Resolved, That Andrew Young, Chief Inspector of the Department of Health, and author of Chicago's Sanitary code, has conducted the duties of his office in a fearless, just and energetic manner.

Therefore, We the Master Plumbers of Chicago, speaking in the interest of our city's health, and the cause of good service in public office, ask that he may be retained in the position he has so worthily administered.

Resolved, That a committee of this association present these our wishes, to His Honor, Mayor Washburne.

Resolved, That a copy of our proceedings be published in the daily papers.

Great applause followed the reading of these resolutions. The following named committee was appointed by President Whiteford to present them to Mayor Washburne: Messrs. Griffith, Murray, Wade, Boyd, Schuster, Baggot, Dalton, Rock, Hamblin, Retski, Nacey, Kelly, Sanders, Whiteford, Hardin, Kelly and Gay. A motion to the effect that the president and secretary of the National Association endorse the action of the local association as officials prevailed.

John Canty, of 3105 State street, is slowly recovering from an attack of sickness which has kept him confined to his bed for four months.

E. Baggot is putting the Durham system of drainage into the new *Herald* building which will be one of the most elaborately equipped newspaper offices in the West, in every feature of interior construction.

Charles Cavanah, of the firm of Young & Cavanah, of 995 W. Madison street, has gone to Mt. Clemens with the hope that the hot springs may have a beneficial effect on his health which has been very poor for some time past.

Then there is the jerry plumber
With the jerry builder bummer,
Who will fit you up a house mighty cheap.
But you will have diseases,
In the thaws or in the freezes,
That will raise you on your doctor bills a heap.

The voice of the Chicago plumber regardless of party is for the retention of Mr. Andrew Young as Chief Inspector of the Health Department.

If the plumbers were given the proper opportunity, they could make a display at the World's Fair that would be the most interesting and valuable of any exhibits that will be made.

On the brightest day of the bright June month,
In the loveliest tide of a lovely summer,
There were sadness and grief in a sorrowful home,
All on account of the cheap jerry plumber.

No one should live in doubt regarding the sanitary condition of his home. If the plumbing is suspected of being out of repair, no time should be wasted in getting a good plumber to inspect it and repair whatever defects may be found. It is delay in this matter which works the greatest evil.

Some folks think that the plumber's no use,
And they employ an alleged one unworthy the name;
And they hang their pipes with the tinner's best skill,—
But the microbe gets there just the same.

There is no use talking any longer about the plumber being merely a mechanic. He is that and a good one, but he is vastly more. He joins mechanical skill with the most useful and important scientific knowledge, and puts both to practical use in the promotion of man's highest welfare. It is a sorry commentary on

that portion of mankind who do not recognize and appreciate him as such.

"I don't like plumbers," the bacillus said,
As he raised his proud and haughty head
In withering scorn.

"They always give me the worst of the deal,
And knock me out with their water seal
As sure as I'm born."

The *Evening Wisconsin* of the 25th inst. says: Yesterday a number of journeymen plumbers were induced to come to the city by members of the Master Plumbers' Association, to take the places of locked-out Milwaukee plumbers, but they had hardly arrived when some of the locked-out men took them in tow and persuaded them to return to Chicago again at once. About 120 plumbers are idle, and the employes of nearly every plumbing establishment are involved in the lock-out. In a few shops, including that of J. C. Stevens, who is not a member of the Master Plumbers' Association, they continue at work. The question at issue between the plumbers and their employers is not one of wages nor of hours, as the demands of the men for the adoption of the eight-hour system were granted, and they had not yet asked for an increase of wages when the lock-out occurred. With them, as with the carpenters, their employers objected to the rule that requires members of the Building League to refuse to work in company with non-union men of any trade. The master plumbers wanted this rule disregarded and their men refused to do so, hence the lock-out. The journeymen have established headquarters in the Spence building, on Grand avenue, and propose to fight it out in company with the other unions.

The striking plumbers of Providence, R. I., claim to be receiving aid from their central union.

The New York Board of Health have issued revised plumbing rules in which some important improvements have been made.

'Twas a little piece of pipe
With a curious turn and press,
Which fashioned it in form
Just like the letter S.

'Twas connected with a waste
Which joined another pipe,
Securely held in place
With joint of skillful wipe.

A microbe started through it,
But with a flop and flap
It fell full length into
A plumber's vented trap.

"Confound the blasted plumber,"
The gasping microbe cried;
Then said in haste its shortest prayer,
And straightened out and died.

The laborers at Gilbert, Hodge & Co.'s lumber yard drank freely of water from an old well, and as a result of poison from sewerage five are dead and several critically ill.

George Kobolt, who sold his shop at the corner of Wells and Eugenie streets, and went west a year ago to seek his fortune, has returned to Chicago, and is at present with Alles & Bro. He still thinks Chicago is the best place on earth.

James A. Campbell, of Elmira, N. Y., writes: The master plumbers of this city have elected the same officers for the ensuing year as those of last year: James Walker, President; John Sadler, Vice-President; Fred LeValley, Treasurer; James A. Campbell, Secretary. We hold our regular meetings the 1st and 3d Wednesdays of each month. Plumbing work is very slow here this spring, but what is done is done better than in former years.

There being a business, dollars-and-cents side to plumbing as well as to all other pursuits, it is meet and proper that the welfare of plumbers be discussed from a business point of view.

The plumber is alleged to have his robbin ways, but he differs from the robbin in this: the robbin pipes his lays, the plumber lays his pipes.—*Boston Courier.*

A Montreal plumber addressing the plumbing class at the Montreal School of Arts, imparted the following advice: "Improve your minds, read good books of all kinds, take the trade papers, keep posted and well up, and when an opportunity for a good position comes, as come in the course of time it must, you will be qualified to fill it, and if the best qualified you will be sure to get it.

The Health Department of Indianapolis, Ind., is making the first real genuine sanitary inspection of the city that has been made for years, and around town the officers find many places where the services of a plumbing inspector are badly needed. The Scottish Rite block was found in bad condition, and was ordered cleaned. Sanitary officer Sandborn has filed a complaint against Charles Black, of Pennsylvania and Maryland streets, for failing to have a vault cleaned when notified to do so.

The truth about the master plumbers is that they do more for the public good than the public does for itself, and the worst of it is the public does not recognize or appreciate it.

St. Paul men are not to be left when it comes to securing contract work. Last week the State Reform School Board met to consider and award contracts for plumbing and gasfitting and for the heating of the new buildings, which it is hoped will be ready for occupancy by Nov. 1, 1891. A number of proposals were considered for furnishing the plumbing and gasfitting, but that of W. J. Freaney of that city was most favorably considered, and to him was awarded the contract for $12,672. The contract for putting in boilers and other necessary heating apparatus for the main building was awarded to William Rodger & Co. of St. Paul for $16,000. A. A. Pond of Minneapolis, received the contract for heating the girls' building at $5,053.

A blustering bacillus on one bright morn
Said, "I've a notion to render that home forlorn
That I spied."

But a vent pipe caught him up with a puff
And whisked him out on top of the roof
And he died.

Fire in the machinery works of Davis & Cresswell at Denver last week resulted in a loss of $100,000.

About the first time a city wants a plumbing law passed there are enough cranky Legislators fool enough to prevent it.

WHERE PLUMBING WORK IS BEING DONE.

5003 Ashland Avenue, J. J. Curtin; Aberdeen and Clark streets, W. Bletch; Ashland ave. and Madison, J. J. Wade; 503 Albany ave., J. Breen; 4205 Atlantic, A. Miller; 5031 Ashland ave., J. J. Curtin; Bradley near R. R. track, Frank Falk; 714 Belmont ave., R. H. McCabe; 4432 Butterfield, F. N. Kuhn; 8 Belmont, P. Schaefer; Bradley bet. Noble and N. W. Ry., Frank Falk; Blanche east of Noble, F. Falk; Boulevard Place bet. Vine & G. B., C. J. Herbst; Centre ave. south of Fifty-third, M. Stack; 1275 Clark, I. A. Milne; Chicago ave. and Sixty-seventh, D. Walsh; Cottage Grove and Sixty-third, D. Walsh; 4636 Champlain ave., J. H. Killian; 2817 Cottage Grove ave., J. T. Mathew; 954-8 Dudley, H. Breyer; 4608 Dearborn, M. Stack; 5138 Dearborn, M. Stack; 2723 Dearborn, J. Teutsch; 116 DeKalb, T. Bunting; Division and Wood, J. Walsh; Division and Newton, J. Walsh; Duncan Park, A. Miller; 9134 Erie ave., Brunt Bros.; 8919 Exchange, Webster & Crombie; 6512 Evanston ave., J. B. Sheville; 627 Forty-seventh, M. Stack; Fifty-ninth west of Sangamon, M. Stack; Fifty-first opposite Emerald, M. Stack; 155 Frankfort, H. Breyer; 633 Forty-seventh, M. Stack; Forty-seventh west of Aberdeen, M. Stack; 3203 Fifth ave., J. Teutsch; Fifty-first west of Calumet, E. T. Sanford; Seventy-sixth and Madison ave., D. Walsh; 1170 Fulton, Wm. Maclay; Fifty-second near Kimbark ave., T. Harvey; 484 Forty-second, J. Donan; 119 Fifth ave., Foskett & Brown; Forty-ninth and Michigan ave., F. N. Kuhn; 4020 Grand boul., D. Walsh; 248 Hervey, H. Breyer; 3118 Halsted, Cotter & Sons; 3204 Halsted, Jos. Breen; 266 Irving ave., Foskett & Brown; 1399-1401 Jackson, J. Breen; Kedzie ave. south of Ogden ave., P. Becker; 253 Lasalle ave., Bayha & Bachman; 472 Lincoln, F. Falk; Lake near Kedzie ave., D. J. Jack; 3024 Michigan ave., J. Teutsch; Matteson west of Wallace, M. Stack; Maryland, south of Sixty-fifth, E. T. Sanford; McChesney & Sixty-fourth, D. Walsh; 913 Maplewood ave., T. Foley; 716 Monroe, Foskett & Brown; 457 Ogden ave., T. Bunting: Portland ave. and Twenty-

seventh, J. H. Killian; 979 Rockwell, H. Breyer; 635 Root, M. Weber; Southport ave. and Nellie, F. Neustadt; Simons ave, J. J. Geiss; Seventy-sixth and Madison ave., D. Walsh; 4235 St. Lawrence ave., J. B. Armstead; 2833 Shields ave. J. Teutsch; 4454 School, A. Miller; 890 Turner ave., P. Becker; 1285 Van Buren, Hamblin Plumbing Co.; 455 Wood, C. F. Klentz; 530 Washington, M. McDonald; 49 Winthrop ave., W. Bletch; 5617 Winter, P. Schmidt; 3141 Wall, J. Teutsch; 1153-55 Western ave., W. J. Rankin; 4403 Wentworth ave., J. Teutsch; 609-11 Wells, Valentine Ruh; 6728 Wabash ave., S. W. Shiner; 6814 Wentworth ave., L. Clark; 521 Washburne ave., John Watson; Sixty-eighth and Winter, D. T. Dewar; 888 Washtenaw ave., Harvey & Mose; 5426 Wentworth ave., J. Teutsch; 647 Western ave., T. Bunting; 7309 Yale, W. Bletch.

FOR THE DIGESTION.

Clothes do not make the man, but the gay youth frequently owes a good deal to his tailor.—*Cape Cod Item.*

Professor—"I fear dot I gome too late." Affable Young Hostess—"Ah, no, professor; you cannot come too late."—*Judge.*

The man who knows he was one kind of a fool yesterday often has a suspicion he is some other kind of a fool to-day.—*Ram's Horn.*

"Did you ever take a temperance drink?" "Yes," responded the Kentuckian, sadly, "I passed through the experience once."—*Life.*

The man who "feels himself to be different from other men" shouldn't always brag about it. Dime museum freaks are in the same fix.—*Puck.*

"This is in full of account," said the bar keeper as he took the change out of a bill. "Also," replied the customer, "on account of a full."—*Washington Post.*

"But he is a fashionable dentist?" "I should say he was. He receives his clients in the parlor and operates on them in his drawing-room."—*Philadelphia Times.*

"Paw," asked Tommy Figg, "what does 'years of discretion' mean?" "It means," interrupted Mrs. Figg, "that a man is old enough to drink whisky."—*Indianapolis Journal.*

"Is your husband a religious man?" "I am not quite certain. When I hear him speak in the prayer meeting I think he is; when I hear him speaking at home I think he isn't."—*New York Press.*

Before his name was well afloat,
Dame fortune played him sorry pranks,
And every manuscript he wrote
Came straightway back, "declined with thanks;"
But now he's known from pole to pole,
Full many an editor he frets;
With groans his stiffish rates they dole—
His stuff's accepted with regrets!"—*Puck.*

An English publisher announces a new work entitled, "He Always Pleases his Wife." It is fiction.—*Boston Post.*

"Look here," growled the advertiser to the country editor; "I ordered my advertisement placed next to reading matter, and you've put it among your editorials!"—*Harper's Bazar.*

Necrologist—What is there to say about old Dornale; he was in the Legislature for a time, wasn't he?

Editor—Yes, but there is no use hurting the family's feelings! —*Puck.*

She—The newspapers never get anything right.

Her visitor—Yes, that's so. By the way, did you see that flattering paragraph in the *Era* night before last about your husband?—*Somerville Journal.*

"His editorial habits cost him a pretty penny the other day."

"How?"

"His wife had a diamond ring worth a thousand dollars sent to him on approbation. He didn't like it and threw it in the waste-basket."—*Harper's Bazar.*

Pompous Author (to veteran editor)—What would you advise a man to do whose ideas are in advance of the times?

Veteran Editor (promptly)—I would advise him to sit down and wait for the times to catch up.—*Drake's Magazine.*

"You seldom hear a good word for the American girl who marries a poor nobleman," remarked the Snake Editor.

"Seldom or never," replied the Horse Editor.

"And yet she merely husbands her resources."—*Pittsburg Chronicle Telegraph.*

It is said that George Washington never went fishing in his life. No wonder he could never tell a lie.

The difference between the barber and the sculptor is, the barber curls up and dies, while the sculptor makes faces and busts.

Newspaper Clerk—Your advertisement reads: "Wanted, a little girl to mind a baby." Don't you think it would sound better if it read like this: "Wanted, a little girl to care for a baby?"

Advertiser—No. Mind is the correct word. You don't know that baby.—*Judge.*

"Ikey," exclaimed Abram Einstein, as he glanced over his son's copybook, "who wrote dat gopy, 'nothink sugseeds like sugsess'?"

"Mein teacher," replied Ikey.

"Dot vos all wrong, Ikey. Nothink sugseeds like failures, und blendy of dem. Don't you forget to remember dot."—*Brooklyn Life.*

"How glorious it is to be engaged in a purely intellectual occupation!" murmured a young maiden, gazing rapturously into the admiring eyes of an editor—"your own mental faculties for tools, and the whole universe for a workshop. Now tell me," she added, "what do you find the most difficult thing connected with your noble profession?" "Paying the staff," said the editor.—*Ex.*

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Flanders & Zimmerman have prepared plans for a 3-story school building, 255x134, to be used for the Northwest Division High School, and to be erected at the corner of Potomac avenue and Davis street; cost, $100,000. The same architects have planned a 3-story and basement school building, 145x86, to be erected on North Fifty-ninth street and Western avenue; cost, $60,000; also a 3-story residence 40x70 for Clarence Knight on Calumet avenue near Thirty-third street, to cost $18,000. W. H. Drake has planned a 4-story flat building, 125x90, to be erected at the corner of West Adams and Laflin streets; cost, $80,000. The same architect has planned a 4-story and flat building, 40x90, to be erected at 1508-1512 Wabash avenue by Miss Howlett; cost, $25,000. F. B. Abbott has planned a 5-story and basement flat building, 46x125, to be built on Stanton avenue near Thirty-sixth street by R. B. Probasco; cost, $75,000. A. M. F. Colton has planned a 2-story and basement residence, 43x63, for S. W. Rawson, to be erected at Fiftieth street and Ellis avenue; cost, $25,000. R. G. Pentecost has planned a 2-story basement and attic frame dwelling, 32x50, for W. S. Burling, to be erected at South Evanston; cost, $7,000. He has also planned a 3-story basement residence, 25x73, for Edward Mendel, to be built on Michigan boulevard near Forty-second street; cost, $15,000. J. L. Silsbee has planned a 2 story basement and attic residence, 35x53, for W. S. Smyth, to be erected at Evanston; cost, $15,000. Charles S. Frost has planned a 4-story and basement store and flat building, 158x93, to be erected on Clark street near Belden avenue, by William Grace; cost, $50,000. August Fiedler has planned a 2-story and basement flat residence, 30x65, for F. Madlener, to be built at Fullerton avenue and North Clark street; cost, $10,000. C. L. Stiles has planned five 3-story residences for J. F. Pershing, to be built at the corner of Fifty-third street and Kimbark avenue; cost, $30,000. He has also planned two 3-story flat buildings for J. T. Sullivan, to be built at 225 Sedgwick street; cost, $14,000. Also a 1-story boiler shop, 60x140, for McGregor & Co., at Francisco street and Carroll avenue; cost, $8,000. He is also reconstructing the Flood Block on Fifty-third street, Hyde Park, which was recently destroyed by fire; cost, $20,000. Furst & Rudolph have designed a 4-story and basement store and flat building, 20x80, to be erected on State near Eighteenth street, by A. Stone; cost, $12,000. Also a 3-story and basement flat building, 25x55, for D. Sauer, to be built on La Salle avenue near Oakley street; cost,

$16,000. Also a 3-story and basement tenement house for W. Goldstein, to be erected on Fourth avenue near Polk street; cost, $13,000. Eugene Bivert has planned a 4-story apartment house, 100x100, to be erected on northwest corner of Calumet avenue and Twenty-ninth street; it will be constructed of rough stone, elaborate hardwood interior, and will be warmed by steam; cost, $120,000. Park & Fuller have planned a 4-story and basement rear addition, 48x50, to Van Buren Hall, at California avenue and West Madison street; cost, $30,000. Holabird & Roche are making preliminary sketches for a beautiful building to be erected on the site of the Vienna bakery, on the south side of Washington street between State street and Wabash avenue, by the Chicago Real Estate Trustees. The lot has a frontage of 50 feet and a depth of 110 feet. Should a new building be erected it will probably be ten or twelve stories high; the estimated cost is $600,000.——New York City, N. Y.: Lamb & Rich have designed for the Germania Life Insurance Co. an 8-story office building, 40x125, to be built on the southeast corner of William and Cedar streets. Cleverdon & Putzel have designed for Williams & Co. a 3-story brick, iron and stone extension, 25x132, to be added to their premises at the northwest corner of Third avenue and One Hundred and Twenty-fifth street, at a cost of $18,000. Lamb & Rich have drawn plans for a brick and stone residence, 56x90; with stable, 30x65; to be built for John Matthews, on the corner of Riverside drive and Ninetieth street. Ralph S. Townsend has designed for Havens & Winter a 6-story brick, stone and iron warehouse, 100x100; to be built at Nos. 167 to 173 Wooster street at a cost of $100,000. Richard Berger has designed for L. Hirsch a 6-story and basement brick, stone and iron factory, 51.2x100, to be built at Nos. 182-184 Grand street at a cost of $40,000. Cleverdon & Putzel have prepared plans for J. Cook for a 6-story brick, iron and stone warehouse, 50x100, to be built at Nos. 209-211 East One Hundred and Thirty-fifth street at a cost of $50,000. Richard Berger has designed for S. Goetz a 6-story and basement brick, stone and iron factory, 36.8x81.4, to be built at No. 68 New Chambers street at a cost of $20,000. Webber & Drosser have designed for George Theiss a 5-story brick and stone flat, 25.5x100, to be built at No. 1071 Park avenue at a cost of $20,000.——Philadelphia, Penn.: Architects Hazlehurst & Huckle will soon invite estimates upon plans they have prepared for the new Odd Fellows' temple, to be erected at the southeast corner of Broad and Cherry streets. About $200,000 has been raised by the members of the Mercantile Literary and Social Club, which will be expended upon a magnificent new clubhouse, to be built in the neighborhood of Broad and Green streets. Fifty dwellings will be built at Chestnut Hill by H. H. Houston. J. E. & A. L. Pennock have been awarded the contract for the erection of a handsome 11-story office building upon the site of the old Barnum Hotel, Calvert and Fayette streets, Baltimore, Md. The structure will cover an area of 230x140, and will cost upward of $600,000. A factory building, 50x100, four stories high, will be erected on the west side of Twenty-first street north of Hamilton, by William Wood & Co. An operation of nearly 300 houses has been started by Charles A. Warfield at Twenty-eighth street and Columbia avenue. The congregation of the Fourth Presbyterian church at the southwest corner of Twelfth and Lombard streets, has purchased a lot, 105x125, at Forty-seventh street and Kingsessing avenue, upon which a handsome new edifice will soon be erected.——Washington, D. C.: W. Bruce Gray has planned two houses for W. Harper, to be erected on Benney street, Columbia Heights; cost, $15,800. Donaldson & Hersley are the builders. Architect N. T. Haller has plans for six dwellings to be erected on Maple avenue by W. J. Coulter; cost, $20,000. The Baltimore United Oil Co. will erect a $10,000 warehouse at Half and K streets, southwest. Architect Joseph C. Johnson has plans for a 2-story and basement dwelling, 32x53, that Mr. C. T. Bride will have built on B street between First and Second streets, southeast. The cost will be $10,000. The same architect has designed a Baptist Church to be built at Henderson, Ky. It will be of brick and stone, two stories in height, 80x80, and will cost $25,000.——Detroit, Mich.: Martin Scholls & Sons, 2-story brick dwelling, 825 Cass avenue; cost, $30,000.——Minneapolis, Minn.: F. B. Harrington, 2-story dwelling, 2552 Colfax avenue; cost, $6,000.——St. Louis, Mo.: G. H. Brueggeman will build four 2-story dwellings at a cost of $10,000.

HEATING AND LIGHTING.

Vallejo, Cal.: H. L. Lazelle, city clerk, can furnish information regarding proposed street illuminating.——Seattle, Wash.: A municipal electric lighting plant costing $75,000 is under discussion here.——Whitehall, N. Y.: The Whitehall Electric Light and Power Co., has been incorporated with a capital stock of $50,000.——Newburg, N. Y.: Improvements to cost $50,000 are to be made to the plant of the Consumer's Gas Company.——Charleston, W. Va.: The City Electric Light has been incorporated by Cleon Moore and others.——Neihart, Mont.: The Neihart Electric Light and Power Company has been incorporated with a capital stock of $20,000.——Attleboro, Mass.: The people have voted in favor of electric lights.——New plants or extensions of existing systems are reported as probable in the following places: Rockport, Me., address L. C. Christian; Gilroy, Cal.; Highlands, Colo., address F. P. Arbuckle; Uniontown, Ala.; Fremont, Neb., address F. L. Burrell; Vassar, Mich.; Marshfield, Ore., address the Electric Light and Power Co.; Roanoke, Va., address E. B. Fisher; Richlands, Va., address the Richlands Water, Electric Light, Gas and Power Co.; Warrenton, Va.; Caribou, Me., address the Caribou Water Co.; Livermore, Cal.; Wayville, N. Y.; Morris, Ill.; Oneonta, N. Y.; Warren, R. I.; Central Falls, R. I.; Watkins, N. Y., address A. A. Cowing; Ridley Park, Pa.; Alliance, O.; Morning Sun, Ia.; Albia, Ia.

SEWERAGE NOTES.

Providence, R. I.: The State Legislature has under consideration a bill authorizing the city to borrow $2,000,000 for sewer construction.——Ashtabula, Ohio.: One and one-half miles of sewer will be constructed.——Decatur, Ala.: $50,000 will be spent on the sewerage system.——Mobile, Ala.: Mayor J. C. Rich can give details of proposed sewage improvements. The question of putting in a complete system for the entire city is being agitated.——Riverdale, Ill.: The sewerage question is being discussed by local officials.——Alameda, Cal.: The City Council has authorized the construction of sewers in numerous streets of this place. City Clerk James Millington can furnish particulars.——Carson City, Nev.: The city will issue bonds in the sum of $25,000 for a sewerage system.——Amsterdam, N. Y.: Mayor Breeden can furnish particulars concerning a number of new sewers contemplated.——Rochester, N. Y.: The city surveyor has been directed to prepare an ordinance for the construction of the east side trunk sewer in accordance with the plans of Engineer Kuichling. The estimated cost of the work is $1,000,000, being $23.40 per foot, with a length of 42,772 feet.——Oldtown, Me.: A sewerage system is proposed.——Laconia, N. H.: Bonds will be issued to defray the expense of constructing a sewer system.——Middleboro, Mass.: The town has made an appropriation of $20,000 to commence its sewer system.——Falmouth, Mass.: A system of sewerage is to be built. Address Mr. Geo. W. Parke of Boston.——Nyack, N. Y.: A general system of sewage will be laid out.——Hornellsville, N. Y.: A law has been passed authorizing the construction of sewers.——South Orange, N. J.: The Trustees have passed an ordinance providing for the construction of sewers to cost $60,000.——Bridgton, N. J.: Mr. Rudolph Hering, Mr. Howard Murphy and Col. Geo. E. Waring, Jr., have been engaged to examine and report upon a system of sewers.——Roanoke, Va.: Mr. Rudolph Hering is furnishing plans for a system of sewers.——Bellaire, Ohio: $15,000 will be expended in the sewerage of the 5th ward.——Ironton, Ohio: The city engineer has prepared plans for a "separate" system of sewerage.——Roseland, Ill.: The town desires connection with the Pullman system or a separate sewage system of its own.——Sycamore, Ill.: A system of sewers is projected.——Joplin, Mo.: A complete system of sewerage is to be constructed.——Dallas, Tex.: City Engineer D. A. Poyner says that about 30 miles of additional sub-mains and laterals are required, and suggests an examination by an expert sewerage engineer.——Carson City, Nev.: A system of sewers will be built at a cost of $25,000.

WATER WORKS NOTES.

Braintree, Mass.: It is the intention of the Water Commissioners to add three or four miles of main pipe to the water works system.——Dartmouth, N. S.: $100,000 has been voted for

water works.——Union, N. Y.: Engineers have been secured to look the ground over with a view to putting in a system of water works.——Richland, Va.: The Richlands Water, Electric Light, Gas and Power Co., has been organized with a capital of $25,000. For particulars address Geo. R. Dunn.——Providence, R. I.: A bill has been reported in the State Legislature authorizing the city to borrow $500,000 for water works maintenance.——Avoca, Ia.: The question of putting in a water supply system is being revived.——Middletown, N. Y.: The Board of Water Commissioners have requested the sum of $40,000 for the purpose of making improvements and extensions to the present system.——Cincinnati, Ohio: The state senate has passed the bill which authorizes the city to issue bonds in the sum of $5,000,000 for the purpose of constructing a new system of water works.——San Dimas, Cal.: A reservoir to store water for irrigation purposes is to be built on the San Jose Ranch, near this town. The reservoir will cover 500 acres, and will hold 6,000,000,000 gallons.——Union, Ore.: The City Council has ordered a survey made for the establishment of water works here, and also for constructing a reservoir at the head of Catharine Creek, for the purpose of storing water for water works purposes.——McPherson, Kan.: The Western Water and Electric Light Company has been incorporated here with a capital stock of $25,000, to erect and operate water works and electric light works, and furnish steam and electric power.——Lonaconing, Md.: The town has decided in favor of water works.——Fairmont, W. Va.: The question of issuing bonds in the sum of $20,000 for water works purposes is to be decided at a public election. Address the Mayor for particulars.——Riverdale, Ill.: The citizens are agitating the question of water works.——Peru, Ill.: The city has voted in favor of water works.——Comanche, Tex.: The people are endeavoring to secure water works.——Waitsburgh, Wash.: A special election will be held in August to bond the city for about $25,000 for a water works system.——Akron, Ohio: The Mayor advises that the city put in a system of water supply of its own, using Springfield Lake as a source of supply.——Sheldon, Ia.: Mayor John Bowley can furnish information regarding the proposed $20,000 system of water works.——Ponca, Neb.: At a special election those in favor of water works won.——Aurora, Mo.: The people have voted in favor of works.——Ft. Worth, Tex.: The city's new charter authorizes water works and general improvement bonds to the amount of $1,000,000.

BIDS AND CONTRACTS.

Portland, Ore.: Bids are wanted for 936 tons of pipe for distributing mains.——Vallejo, Cal.: Bids are wanted until May 15, for supplying 2,000 C. P. lights for street illuminating on a five-year contract. Address H. L. Lazelle, city clerk.——Fulton, Mo.: The Board of Managers of the State Lunatic Asylum will receive bids until May 12, for the erection and completion of two fireproof wings to the asylum. Plans, etc., may be seen at office of M. F. Bell, Architect.——Dallas, Tex.: J. C. O'Connor, President of the Dallas Opera House Company, wants bids for the remodeling of the opera house. Plans can be seen at the City National Bank. Proposals are also wanted until May 20, for furnishing a 10,000,000 gallon vertical pumping engine. Address D. A. Boyner, City Engineer.——Sweetwater, Tex.: The Commissioners Court, of Noland County, will receive bids until May 11, for the tearing down and rebuilding of the court house at this place. Cost not to exceed $12,000.——Athens, Ga.: Proposals are wanted until May 4, for the construction of the extension sewer in District No. 1. Address J. W. Barnett, City Engineer.——Cincinnati Ohio: Proposals are wanted until May 11, for furnishing furnaces, graters and linings, street valve boxes, iron pipe and special castings. brass castings, etc., for the year ending April 30, 1892. Address Louis Reemelin, as above.——Montgomery, Ala.: Proposals are wanted until May 18, 1891, for furnishing and heating apparatus for two separate eight-room brick school buildings, one already built, the other in course of construction. Bids must be separate for each building and must state method of heating. Address Thomas H. Watts, Jr., Chairman Committee on Schools, Montgomery, Ala.——Austell, Ga.: Proposals are wanted, no date specified, for furnishing an electric plant of 300 lights. Address Mayor C. J. Shelverton.

KOCH'S LYMPH.

Dr. Koch's lymph will doubtless prove a great boon to suffering humanity, but it is yet in the experimental stage. The remedial value of the waters at Hot Springs, Ark., has been demonstrated. This great health and pleasure resort is reached directly via the Wabash road. Compartment sleepers Chicago to St. Louis, where direct connection is made with a double daily line of sleepers for Hot Springs. Berths reserved through.

WHAT IS A VOLT.

During a recent examination a lawyer asked Thomas A. Edison what was meant by the number of volts in an electric current. To which he replied: "I will have to use the analogy of a waterfall to explain. Say we have a current of water and a turbine wheel. If I have a turbine wheel and allow a thousand gallons per second to fall from a height of one foot on the turbine, I get a certain power, we will say one horse-power. Now the one foot of fall will represent one volt of pressure in electricity, and the thousand gallons will represent the ampere or the amount of current. We will call that one ampere. Thus we have a thousand gallons of water or one ampere falling one foot or one volt or under a pressure, and the water working the turbine gives one horse-power. If, now, we go a thousand feet high, and take one gallon of water and let it fall on the turbine wheel, we will get the same power as we had before—namely one horse-power. We have got a thousand times less current or less water, and we will have a thousandth of an ampere in place of one ampere, and we will have a thousand volts in place of one volt, and we will have a fall of water a thousand feet as against one foot. Now, the fall of water or the height from which it falls is the pressure or volts in electricity, and the amount of water is the amperes. It will be seen that a thousand gallons a minute falling on a man from a height of one foot would be no danger to the man, and that if we took one gallon and took it up a thousand feet and let it fall down it would crush him. So it is not the quantity or current of water that does the damage, but it is the velocity or the pressure that produces the effect."

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

CHICAGO, MILWAUKEE & ST. PAUL RY.

Electric Lighted and Steam Heated Vestibuled Trains, with Westinghouse Air Signals, between Chicago, St. Paul and Minneapolis, daily.

Through Parlor Cars on day trains between Chicago, St. Paul and Minneapolis.

Electric Lighted and Steam Heated Vestibuled Trains between Chicago, Council Bluffs and Omaha, daily.

Through Vestibuled Sleeping Cars, daily, between Chicago, Butte, Tacoma, Seattle, and Portland, Ore.

Solid Trains between Chicago and principal points in Northern Wisconsin and the Peninsula of Michigan.

Daily Trains between St. Paul, Minneapolis and Kansas City via the Hedrick Route.

Through Sleeping Cars, daily, between St. Louis, St. Paul and Minneapolis.

The finest Dining Cars in the World.

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A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the Big Four Route, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the Big Four Route, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

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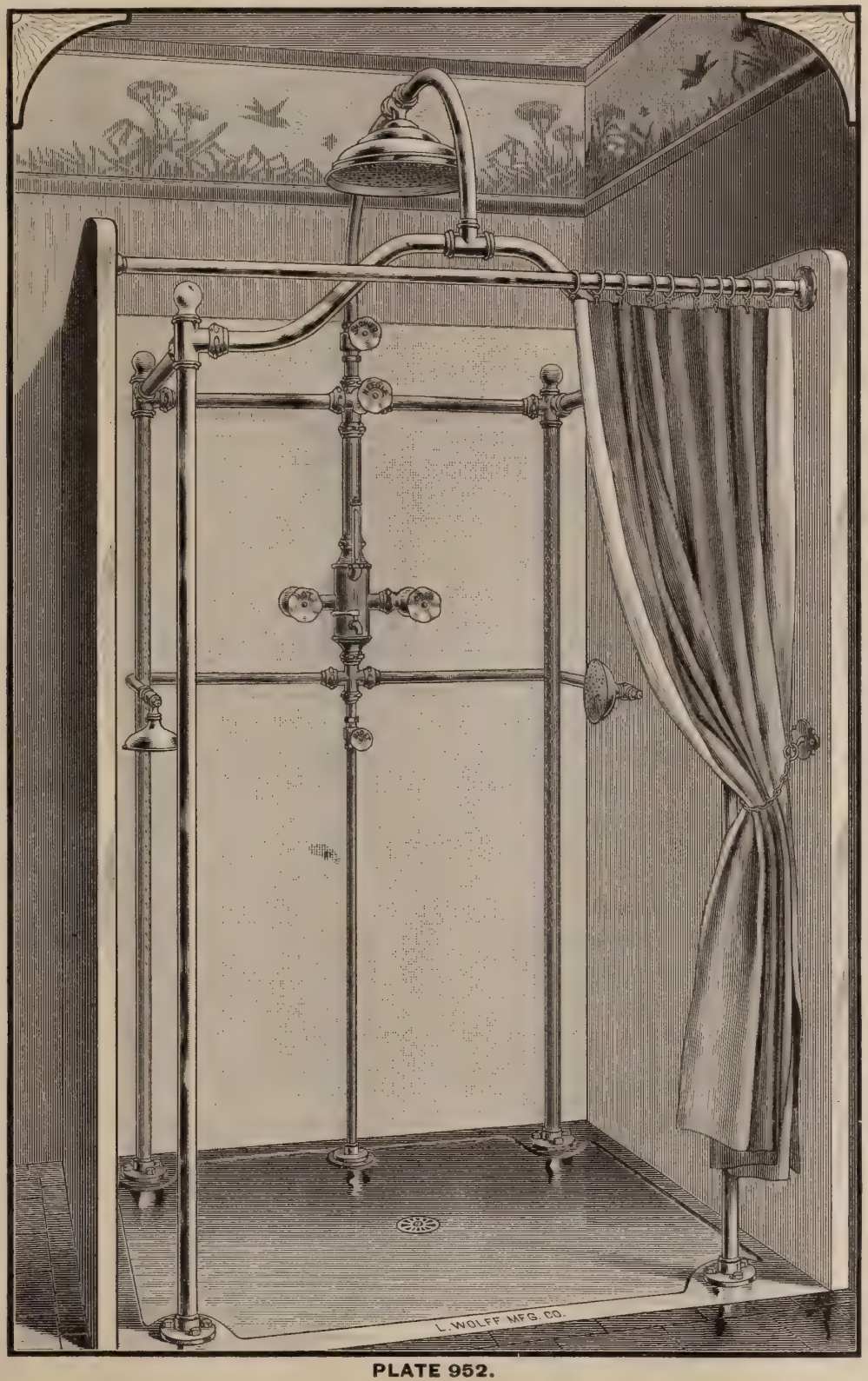

PLATE 952.

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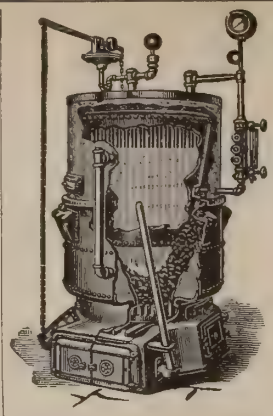

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THE CLEAN SWEEP

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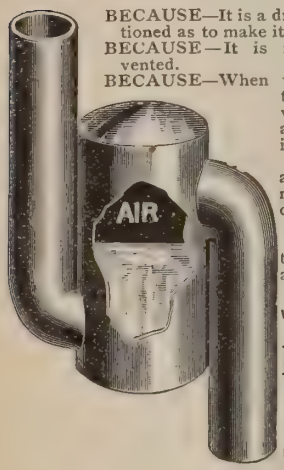

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BECAUSE—When vented the vent is taken out above the water level making it almost impossible for it to get stopped up.
BECAUSE—It has a large trap screw, making it easily accessible.

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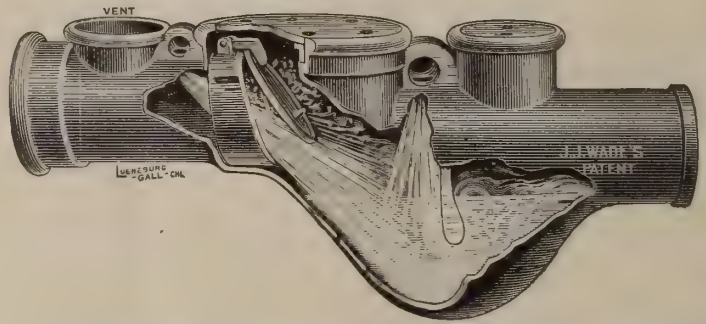

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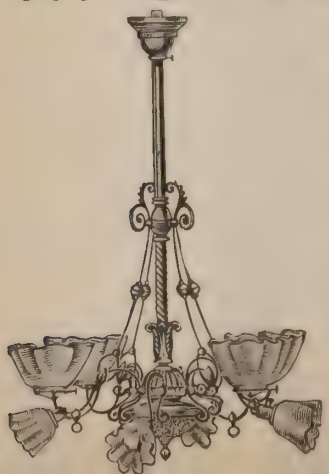

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THE SANITARY NEWS

IS PUBLISHED EVERY SATURDAY

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THERE is too much striking going on. Troubles arise in every business and between all parties. The important object is to settle these troubles with the least cost to all parties. Strikes are expensive and their arguments are often not based on reason. There can be a way found to settle these matters without a resort to the ruinous and costly strike. There is surely some ground on which the parties can meet. Plumbers' strikes are reported from several cities where business seems at a standstill. This results in a loss to the employer and employe, and a remedy should be speedily found. Harmony is often secured through compromises. They may knock the walking delegate out of a job, but all labor unions would be better off if this numerous individual should be delegated to walk out of his vocation and stay out.

THE sanitary officers of Indianapolis, Ind., made about six hundred inspections during April, and for the present month they expect to make over two thousand. Considerable change has been made in sanitary matters, and a general clean-up seems to be the order of the day. Indianapolis is a beautiful city and its sanitary conditions should not be neglected.

IT may be an easy matter to get cheap plumbing work done, but it is a dangerous and expensive way of attempting to be economical.

A CLEAN city promotes not only the health of the people, but adds to the productive value and industrial prosperity of the community.

THE plumber who knows not only how to do a certain piece of plumbing work, but why he does it in that particular way, has the advantage over the one who only knows how. In all trades and professions the whys are as important as the how, and it is much more pleasant and satisfactory to know both the why and the how than simply the how. This means that scientific knowledge should be combined with mechanical skill, both for good work and the pleasure and satisfaction a good workman always feels in the knowledge of his proficiency.

WE publish elsewhere in this issue an article by Mr. Ashdown of the Kansas City Association relating to the improvement of the business of plumbing. This is a subject legitimate for discussion and an interchange of views and opinions by plumbers. If there be any man worthy of his hire, that man is the plumber. His work is difficult, and he has great responsibilities resting upon him, for all of which he should be well paid, for he gives value received.

THE delegates to the ninth convention of the National Association of Master Plumbers are now being appointed, and we would be pleased to have the lists of these delegates from the local associations for publication. We hope there will be no delay in sending them in.

MUNICIPAL boards of health find in the plumbing fraternity the most important agency in the sanitation of cities. The plumbers have been fully recognized in this important service, and as observed by the rules and regulations governing their work. Yet city authorities in many instances fail to see the importance of having plumbers to administer plumbing laws, or plumbers for the inspection of plumbing. The importance of plumbers and plumbing work in the proper sanitation of cities demands for them official recognition. In Indianapolis, Ind., we learn that the senator who formulated the bill providing for a plumbing inspector for that city, desires the position himself. We are also informed that he is not a plumber. Now, the question is, how can any one make an intelligent inspection of plumbing work who knows nothing about plumbing?

FROM several sources we learn of an official report recently made by Dr. Barry, of the inspecting staff of the Local Government Board, on a very extensive inquiry he made last September into the causes of a serious outbreak of typhoid fever along the lower river Tees. The water supply is pumped from this river into tanks for subsidence, after which it is filtered through beds of sand and gravel. The section investigated embraced over 41,000 houses which were thus supplied with water, and about 56,000 houses supplied from other sources. The rate of attack among those using the Tees water was twelve in 1,000, and among the others it was less than one per 1,000. The point of interest in this is the fact that there were abundant opportunities for the river water to

become polluted by sewage. There are many cases of record in which typhoid infection has been traced directly to sewage-polluted water, and it is evident that the necessities of public health will force the problem of sewage disposal upon sanitarians for an early solution.

If everyone, before he make contracts for plumbing work, would go to some good plumber and get instructions regarding cheap and first-class work and materials, he would then be better able intelligently to provide the necessary conditions for a healthful home.

The old adage that anything worth doing is worth doing well, should apply with double force to plumbing.

With this issue The Sanitary News completes its seventeenth volume, and we desire to extend our thanks to its friends for their patronage and good will in the past, and hope the journal may continue to merit their approval and favor. We wish here to give expression to our high appreciation of the many warm friends the paper has made throughout the country which we hope to return in good value in keeping The Sanitary News the leading journal of its class.

Sanitary science is a science that does not relate to the earth we live on or to the heavens we live under, but to the conditions of the homes we live in. We can live on the earth or under the heavens without knowing much about them, but to live best in our homes we must know them well. Geology cannot change the conditions of the earth beneath us, or astronomy those of the heavens above us, but sanitary science can change from unhealthy to healthy the conditions of the homes we live in. Is it not then a science worthy of study? It touches the highest interests of mankind, cleanses and purifies the present generation, and will strengthen and will glorify posterity. The effects of obedience to its laws are not remote but immediate. They touch the every-day life of all, and enter into all the relations of life. They give strength and vigor to whatever capacity in which human endeavor is put forth.

SEWERAGE FOR MOBILE.

Mayor Rich is determined to make the city of Mobile, Ala., clean and healthful despite the action of the Legislature of that state. The plan he has devised may be taken as a suggestion to other cities where there is sad need of sewerage. He has been busily engaged for some time past in working out a plan by which the city may be sewered street by street, yet eventually have a complete interlacing system of sewerage for the whole city. He has outlined in the following circular a plan by which this can be done, and by which also the expense will fall solely upon the property holders who will be immediately benefited by the establishment of sewers. He believes that after the first cost of making connection is met, the use of the sewers will be an economy to the property holders. In a few years, also, the sewers will have been paid for and will thereafter be free. The circular the mayor has drawn up has been sent in duplicate to all the property holders living on Government street, and its terms are meeting with prompt acceptance on the part of the property holders. Following is the circular:

"The failure of the Legislature to pass the proposed amendment to the charter, relative to sewerage and pavement, makes it impossible for the city to accomplish anything in this direction without the voluntary aid of the property owners.

"I believe, however, that much can be accomplished at little cost, if every one interested in the improvement of the city will lend his aid. Sewerage is an important work, and should go before any general effort to pave the city. Some months ago the council invited Colonel George E. Waring, a distinguished sanitary engineer from Rhode Island, to come to Mobile and examine the ground, with a view of obtaining his opinion as to the best plan of sewerage for this city. After an inspection of the city he said, in his address to the council, after discussing various methods: 'My advice, however, would be to complete the sewers in the streets running to the river, and discharge each sewer through a sufficient length of iron pipe, leading well out into the deep water in the channel, and let every street be drained in that way. I believe that would be the end of the work, and nothing more would be necessary.' He also cited various instances in his own experience as an engineer, in support of his opinion quoted above.

"Acting on this opinion, that separate sewers can be laid on streets running to the river, my purpose is to lay a sewer on Government street if I can obtain the co-operation of the property owners. I propose that the city shall borrow such an amount as will be necessary to do the work, and pledge the sewer, and such revenue as may be obtained from it, to the payment of the loan.

"Between Ann street and the river there will be one hundred and ninety connections to make, and, if the property owners will agree to connect with the sewer when laid, and will pay to the city annually six or seven dollars for its use, the city will in five or six years be able to pay the original cost of the sewer, and then dedicate it to the free use of the people.

"Will you agree to use the sewer, and pay for its use the amount suggested? As I contemplate presenting the suggestion to the council, I respectfully solicit an early reply."

This has met with a wide approval and business men express a general willingness to support the movement. The importance of proper sewerage to the health of a community cannot be over estimated, and the plan here devised should commend itself to other cities where this demand of sanitation has not been complied with. Delays are dangerous. The cesspool is filled with death, and the properties of sewage are such that all sewage should be removed from communities as speedily as possible. If no legislative or municipal aid can be obtained, public-spirited citizens should adopt some plan like this to rid their city of the dangers of sewage and the evils that ever have attended and ever will attend the filthy conditions that will result from a want of proper sewage disposal.

WHAT SHALL WE DO TO IMPROVE BUSINESS.*

What shall we do to improve our business? The writer takes this to mean, what shall we, as individual members, do to improve our business financially, thereby improving our success as an association.

The chief object of a business man is, or should be, success financially. What is success? I define it to be a man, who, after starting business on a small scale, as plumbers generally do, finds in a few years that he is out of debt, he owns a comfortable home free of incumbrances; his check at the bank is honored for a reasonable amount, his profits at the close of the year are larger than the previous one; and with diligence he can look forward to the time not far distant when he can retire if he so desires.

During my experience of twenty-three years residence in this city, I have seen but few instances of the successful plumber, and a great number of the unsuccessful ones. I have come to the conclusion that ambition might be appropriately written on the tomb of many who might have been successful.

There is no doubt many of you here to-night can recall many instances of a good mechanic with a fair business education, who, upon starting with a limited capital, would rush in and bid on work who, if compelled to pay cash, could not pay for the soil pipe used, to say nothing of money with which to pay labor and running expenses until he could get his first pay. It might be argued that this is all right, and so it would be if he could secure his contract at a fair profit; but as a rule he secures his work at actual cost or perhaps a few dollars less than cost in order, as he says, to advertise himself and let the public know that he is capable of doing such work, or that the owner is an influential man and will recommend him, and that it will be the securing of more work. He manages to pull through the first two or three jobs, paying a part on all bills due and then he thinks he is succeeding admirably. Finally his part paid bills become due and then he is in the swim; and, in order to keep running, he must have the next large job if he has to take it far below cost in order to meet some of his maturing obligations. After a year or two he finds himself at the end of his rope, in debt and no credit. How much better for him and the balance of the trade, had he let his ambition smoulder and have taken only such work as his capital could have purchased. Having made a fair profit on small

*Read before the Kansas City Master Plumbers' Association by William G. Ashdown.

work, in a few years he would be in a position to buy in large quantities at cash prices.

Another kind of the unsuccessful plumber is he who never thinks of susccess or a permanent business, but comes with the avowed purpose of making money at any cost, and generally starts in by beating the owner or contractor and winding up by beating the supply houses. The latter I have no sympathy for. They sell goods as cheap if not cheaper to that class of customers than they do to those who have lived here for a lifetime and who they know purchase only that which they are able to pay for, whether they collect or not the money from the work. Instances of this class of plumbers are fresh in the minds of many of the members of this association, and the red ink on the credit side charging the account up to Sop & Gain, is still fresh in the books and minds of many of the supply firms.

A class of plumbers,not altogether unsuccessful,are those whom I think were cut out for the ministry. Their conscience will not allow them to charge a fair profit for fear they might possibly take one cent more than belongs to them, and they find, when they come to settle, their customers have left their conscience at home (if they ever had one), and this plumber plods along from year to year with his nose to the grindstone wondering why plumbers as a class are poor. It is not necessary to state why the intemperate plumber is not successful, and I am pleased to say that we have few of such specimens in our city. Various have been the schemes in past years to promote their business. The first was a species of blackmail. Two plumbers would meet, who happened to know each other, and be friendly, a very rare circumstance some years ago. In the course of conversation Brown would remark that Jones had received the contract for the plumbing in White's house, whereupon Smith would throw up his hands in holy horror, and exclaim: "What! Jones! Why he's no plumber, what does he know about plumbing? He never learned the trade; he's a tinker." On parting Smith would go to White and explain that Jones knows nothing about plumbing; "he can't do you a good job, but if you will give me the plumbing, I will guarantee you a good piece of work and put in imported bowls in your closets. Jones has nothing but American bowls, which will craze after a short time."

This scheme failed more times than it worked, but the seed of discord had been sown, and although Jones was an honest and competent plumber, the owner had his doubts, and plumbers as a class were put down as thieves.

The next scheme came a year or two later. Brown and Smith happened to meet and be friendly, and after mutual inquiry how business was, Brown would suggest a remedy like this: "Smith, what do you say to getting up a price list, so we could figure alike? I haven't made a dollar in a year; it's a shame the low figure Jones takes work at. Don't you think we would better go and see Jones and the balance of the boys and find if something can't be done? So afterawhile a meeting is called. Brown explains the object of the meeting, and Smith makes a motion to apoint a committee to make a price list. Jones is doubtful, he has always made a good living and got along fairly well, but he thinks that there might be something in it, and after some objections he finally consents. A price list is gotten up, which they all agree to live up to. For a time things work nicely and then comes the fun. Jones puts in a bid on a certain job; according to the agreement Brown puts in his, Smith holds off; he wants that job bad now. How to get it without violating his agreement he hardly knows; so, after a long conversation, in which he draws out of the owner about the amount of the lowest bid (who by the way is a very honorable man, who would not think of giving the other bids away), he puts in his figure with the remark: "I see your hose is about worn out, I will send you up a fifty-foot section with a patent nozzle." "Well," remarks Mr. Owner, "your bid is a little high, but I guess you can go ahead with the work; send up the hose." Of course this scheme worked for a short time, then they are back at it again, cutting the life out of work and saying some ugly things about one another.

After a time the plumbers in the East were forming associations and sending out circulars to the plumbers in the West, urging a formation of an association, setting forth the great benefits of organization to be an advancement of sanitary science and mutual protection, of which all sounded well. Brown and Smith met as of yore. Things were running in the old rut. Smith knew it would do no good to spring that old chestnut about prices, so he says: "Brown, let us see if we can't get up an association and have a sanitary ordinance passed. I tell you it is a shame the way some of the work is being done in this city. I saw a job the other day in which the bath tub and wash stand were branched into the water closet trap. I figured on that job and figured to do a first class job. It was for a friend of mine; but Wipe & Snipe beat me so bad that the owner called me a robber. I don't believe they can do good work. Now if we had an ordinance I think we could run them out of business, at any rate we would all know just what to figure on."

An association was formed, a sanitary ordinance was passed by the City Council. Time went on, Wipe & Snipe continued on, no one was run out of business, bids on plumbing were as far apart as ever. So Smith's scheme to improve his business financially failed. These are a few of the many schemes to improve our business, all of which have failed and will continue to fail so long as you attempt to dictate to a business man by resolutions and motions of how to conduct his business.

What shall we do to improve our business?

1st. Figure your cost of the work accurately, add on your per centage and stand by the figures.

2nd. Do not take a contract on which you cannot pay for the material at the end of thirty days, even if you don't collect on that job. *Bradstreet's* review for the year gives the total number of failures at 10,673, of which 4,052 were from insufficient capital; over 40 per cent. of the failures, from trying to do business on wind or some one else's capital. No one can figure the great injustice these failures caused those in the same line, such as cutting prices, &c.

3rd. Do not imagine that you are the only good man in the business. If you can't speak well of your competitors, you can at least keep silent, or think you know more about the plumbing business than every one else. If you want the world to believe that you are honest, don't tell them so; there are too many in that business already.

4th. Do not inform your would-be customer that you employ only men, that you do not figure against So & So; they only employ boys. You will probably be told that he don't care if So & So employ girls; it has to be done according to the ordinance. You succeed only in casting a stigma on your profession, and fail in elevating yourself in his estimation.

Finally, when you meet one of your fellow members, do not stare him out of countenance, but shake hands and be friendly. He might put something in your way so you both could make a dollar at least. "It is better to have the good, than the ill-will of a dog."

Thanking you gentlemen for your kind attention, I remain yours in G. O. O. T. S., which in the language of the Hon. Bardnell Slote, means "Get out of the soup."

CONVENIENT TO HAVE ABOUT.

Workers at various trades know that varnish made with alcohol will get dull and spongy by the evaporation of the alcohol, which leaves water in the varnish, as all commercial alcohol contains water. It is therefore advisable to take a thin sheet of gelatine, cut it into strips, and put it into the varnish; it will absorb in the thin sheet most of the water, and the varnish can be used clear and bright till the last drop.

To remove varnish, the following is stated to be the most effective mixture: 20 pounds solution of caustic soda (20 degrees B.), 1 pound potato starch, and 20 pints of water are placed in a closed boiler and thoroughly agitated. Heat is thus generated, and causes gelatinisation of the mass which is then treated with 57¾ pints of water, and 1¼ pounds of potato starch added to form 100 pounds of product. This varnish remover may be reduced with water to any desired percentage of alkali.

Palladium, which is a whiter, lighter, and more fusible metal than platinum, has of recent years been much used to plate watch movements, says the *Electrician*. According to M. Pilet, four milligrammes (about one-seventeenth of a grain) of palladium is sufficient to coat the works of an ordinary sized watch. M. Pilet recommends the following bath: Water, 2 liters; chloride of

palladium, 10 grammes; phosphate of ammonia, 100 grammes; phosphate of soda, 500 grammes; benzoic acid, 5 grammes. This bath is suitable for all metals except zinc.

The smell of paint may be taken away by closing up the room and setting in the center of it a pan of lighted charcoal, on which has been thrown some juniper berries. Leave this in the room for a day and a night, when the smell of the paint will be gone. Some persons prefer a pail of water in which a handful of hay is soaking. This is also effectual in removing odor of smoke from a room.

The following mixture for the cementing of iron is strongly recommended, says *The Engineer*. Equal parts of sulphur and white lead, with about one-sixth proportion of borax, are the constituents of the mixture, and the three should be thoroughly incorporated together so as to form one homogeneous mass. When the composition is to be applied it should be wetted with strong sulphuric acid, and a thin layer of it should be placed between the two pieces of iron to be connected, these being at once pressed together. This cement will hold so firmly as to resist the blows of a steam hammer and dry so completely in a few days as to leave no trace of the cement, the work then presenting the appearance of welding.

To preserve smoke pipes from rust. Paint the pipe thoroughly, either with coal or wood tar, then fill it with shavings, and set them on fire. The heat roasts the tar, and at the same time opens the pores of the iron, which appear to become filled with carbon, and to be thus preserved from rusting for an indefinite period. A smoke flue is mentioned which was thus treated twenty-six years ago, and is still in good condition. Painting with ordinary coal tar and air-drying is also much in use for smoke stacks, the heat by use making the necessary union for preserving the iron.—*Scientific American.*

For floor polishing, throw a handful of permanganate of potahs crystals into a pail of boiling water, and apply the mixture as hot as possible to the floor with a large flat brush. If the stain produced is not dark enough, apply one or two more coats as desired, leaving each wash to dry thoroughly before applying another. If it is desired to polish the surface with beeswax, a coat of size should be applied to the boards before staining, as this gives a depth and richness to the color. After three or four days, polish well with a mixture of turpentine and beeswax. A few pence will cover the cost of both size and permanganate of potash.

ADVANTAGES OF HEATING BY HOT WATER.

The catalogue issued by Boynton & Co., of New York and Chicago, contains the following on hot water heating:

The comfort and happiness of a home, in all other respects well ordered, depend more intimately upon its heating, ventilation and drainage than upon all other purely physical appliances. Imperfect heating, ventilation or drainage react injuriously upon health, and without health no amount of luxury or wealth can bring even the semblance of happiness. Nothing can exceed the luxurious comfort, combined with heathful conditions, of a thoroughly well heated and ventilated house, and no amount of fine furniture or other auxiliaries of high-class living can compensate for the lack of these essentials to the quiet rest of mind and body which every home should afford. The sleepy, noxious atmosphere of schools and churches, once well nigh universal, can no longer be tolerated. The work of education, as well as all the other work of modern life, has largely increased, demanding reserves of vital force that cannot be supplied except under conditions of uniformly-heated pure air, regular exercise and wholesome diet. No well conducted modern school or church will endure heating and ventilating appliances that were thought all sufficient thirty years ago. In fact, progress in all lines of material improvement is now so rapid that in things scientific and mechanical the lapse of a single decade relegates many once highly-prized systems, machines and devices to the category of ancient history. In no department of the arts is this more strikingly illustrated than in the art of domestic heating. Steam heating was an important improvement, but as a means of heating anything but gigantic office buildings, which have become prominent features in American cities, it has had its day. Even in such buildings it is questionable whether it can much longer maintain its ascendancy in view of what has recently been accomplished in the art of hot water heating.

The concensus of opinion, as held by the best architects, physicians, hygienists and sanitary engineers, is that, in comparing hot water heating with steam the system of hot water heating is the better. This method consists in the natural circulation of heated water in currents set up by heat within the liquid mass, the currents so generated being conducted by pipes between the primary heater and the radiators or heating coils within the apartments themselves, or to and from radiators or coils situated outside of the apartments, and warming them through the influx of air which has previously passed over the radiators. The advantages of hot water heating are easily understood and become apparent upon a very slight consideration of the conditions requisite for steam heating. In the latter there must be steam at sufficient pressure to insure circulation of steam through the pipes, else no heat can be conveyed by the pipes to radiators, and as pipes, radiators and valves must all be sufficiently large to meet the exigencies of coldest weather, it follows that when any heat at all is distributed nearly the entire heating power of the apparatus is developed. As a consequence, in mild weather when only very little heat is required, the apartments are heated to excess and the great discomfort of their occupants.

It is true steam heaters claim that steam heat can be controlled, and inexperienced people are often imposed upon by the statement that partially closing radiator valves or air binding radiators will enable the heat to be perfectly regulated. Of air binding more will be said presently. As to the controlling effect of partially closing steam radiator valves, any one who has tried it knows that it results in the inconvenience of gurgling and water hammering without obtaining the desired result. With a difference of one pound pressure per square inch between the steam pipe and the interior of the radiator, steam enough will flow into the latter through a very small opening in sufficient quantity to heat it; but, as the area of the valve opening is dimished, the radiator becomes an exceedingly unmusical instrument, the whizzing of the steam often becoming intensified almost to to whistling and the condensed water putting in a harsh accompaniment of rattle and snap, The reason for valves and pipes being so large in steam heating apparatus is not that this size is needed for the passage of steam, but that other practical considerations demand such capacity.

Water, when heated, be it only a single degree, begins in its heated portions to seek the highest point in the mass, displacing colder parts, which pass downward to be heated in their turn. Thus, in a system of pipes and radiators connected with a generator of heat, circulation commences as soon as heat is applied to the generator and is continued so long as heat is continued, no matter how little fire is maintained in the fire chamber. It follows that, with proper adjustment, water at any temperature—even as low as 80 deg. F.—may be passed through the heaters, whereas, if steam be used, 212 deg. is the very lowest temperature at which it can be circulated. The heating coils or radiators take substantially the temperature of the steam or water passing through them. So it is plain that a range of temperature of 132 deg. below the temperature of steam is possible in the heaters of the hot water system, and as it is perfectly practicable to maintain the heat at any desired point of this range, there is the utmost facility for regulating the heat according to existing needs at any time.

Air binding radiators means confining the air in them and so preventing their filling with steam. It can be done when a radiator is empty by closing the air vent after some steam has entered; but, at best, this is a very inefficient makeshift, requiring an inconvenient amount of attention and always giving unsatisfactory results.

The placing of two radiators in a room, one of twice the capacity of the other, is another resort of steam heaters to provide for regulation of heat. The smaller one is used singly for mild weather, the larger for cold weather, and both for coldest weather. This arrangement gives three graduations of surface at 212 deg. F. or more, and that is the limit of its regulating capacity—that is to say, there will be three temperatures (and only three) at which the heat supplied is exactly that needed. But besides being a very imperfect mode of regulation, it is usually so objectionable

to place two radiators in any but large rooms and halls that, except for stores, schoolrooms and large parlors, this method is seldom resorted to.

Hot water heating can always be regulated to the exact needs of any atmospheric condition, and the fuel burned can be with great exactness proportioned to the same requirement's and thus, besides being much more easily and accurately regulated, it is much more economical than steam heat in consumption of fuel.

Another and very important advantage of hot water as a medium of conveying heat depends upon the fact that while a pound weight of steam contains 966.5 heat units which are available for steam heating, a volume of water equal to that occupied by the one pound of steam at 212 deg. F. and having a temperature of, say 180 deg. F. contains, roughly, 164,000 heat units available for heating before it cools to 80 deg. F. This enormous difference in the heat quantity, carried by equal volumes, renders water a much more constant and uniform vehicle for conveyance of heat than steam and not quickly and easily affected by differences in firing, as is the case with steam. This alone, were there no other reason for preference, would be sufficient to turn the scale in favor of hot water heating. Suppose, through the carelessness of an attendant, the fire in a greenhouse should go out after being left for the night. If a steam heating system were used it would in a very few minutes cease to be of much use in maintaining temperature, whereas a hot water system would have in it a store of heat that would keep up the temperature of the house for hours and probably for the remainder of the night.

In mild weather, from twenty-five to thirty-five per cent. more fuel will be consumed by a steam heating apparatus than by a hot water system, on account of unavoidable overheating.

Moreover the hot water system of heating is perfectly silent, which cannot be said of a very large proportion of steam heating plants hitherto erected.

What has been said will sufficiently substantiate the great superiority of hot water heating over all methods hitherto known. It now remains to consider recent substantial improvements in apparatus for this kind of heating, which have removed, or at least have greatly lessened, the force of the only objections hitherto urged against hot water heating by steam heating engineers, to wit, that it costs more to supply and erect than steam heating apparatus and that it occupies too much space in a building. Both these objections have been offsets against the otherwise admittedly superior advantages of hot water heating, but in the march of improvement engineering science has not been content that these defects should be perpetuated.

The first step in adapting hot water heating to the needs of all kinds of buildings, including dwellings—the most important of all—is to have such a primary heater, for imparting heat to the water, as will meet all requirements.

PLUMBING NOTES.

Plumbing Inspector Robinson, of Washington, D. C., said recently in the course of an interview: "It would surprise the people of our city if they knew the terrible state of affairs existing in some of the older buildings of the city and yet there is no way to remedy matters. I know of some hotels in which the plumbing is simply dangerous to the health of every guest, sickness-breeding gas permeating entire buildings, and the inmates sicken and die without knowing the cause." Mr. Robinson and Capt. Lusk have prepared new plumbing regulations which will soon be issued. They have been made up in the best shape possble under existing laws; but it will be necessary for Congress to make new laws covering the plumbing regulations for the city, as under the existing law there is nothing which touches plumbing in old houses save in an ordinance of the health office.

R. S. Kirtley of Kansas City, Mo., writes that business with the plumbers of that city is dull and that retrenchment is the order of the day, but their association is getting on harmoniously.

The Columbus, O., *Dispatch* says: The project to effect a national organization of plumbers, gas and steam fitters, inaugurated by Columbus Union of Gas and Steam Fitters, has been abandoned because they have discovered that such a national organization already exists. It is called the United Association of Plumbers, Gas and Steam Fitters and Steam Fitters' Helpers, with headquarters at Washington, D. C., and comprising fifty-eight locals. Columbus Union of Gas and Steam Fitters has sent for a charter and the Plumbers' Union is talking of doing the same.

The Duluth plumbers struck the first of the month for the eight hour day. They also ask that they be required to work only seven hours each Saturday. They demand the same wages they are now getting for nine hours' work, namely, from $3.50 to $4. Their employers claim that there is scarcely any work to do, and a strike will not incommode them.

Aneshansel & Strong of Indianapolis were putting in some water-pipes recently, and dug below the foundation of an Ohio street residence. The wall bulged out and the plumbers are obliged to go to the expense of taking down the front and side wall.

A Jack-of-all-trades went out to plumb
To make the idlers fewer;
Into the cistern he led the soil pipe
And the rain shute straight to the sewer.

Joseph A. Macdonald, Vice-President of the National Association of Master Plumbers, writes that at the regular meeting of the New York Association held April 28, the initiation fee was increased to $25 to be in effect on and after October 1, 1891. The meeting was a very enthusiastic one, and the following delegates were elected to represent the association at the ninth annual convention of the National Association to be held at Cincinnati June 23, 1891: Henry G. Gabay, President; George D. Scott, John Byrns, Joseph A. Macdonald, James N. Knight, Frank Reynolds, William H. Quick, Thomas J. Toumey, William H. McDermott, John Mitchell, Charles H. Kranichfelt, Timothy Sullivan, Edward J. Brady, William Young, Joseph W. O'Brien, James Gilroy, Terence J. McCormack, Phillip Smith, Daniel W. Littell, Edward Murphy, John Miller, Michael J. McDermott, Thomas J. Cummins, Owen McGinnis, Ed. J. O'Connor, M. Ryan.

"They say I belong to the vegetable world,"
Said a bacillis one day;
"Whether animal or plant it matters not,
For whom I meet them I slay."

J. F. Wulf, the well-known traveling man, kindly sends us the following: Jas. Henderson, of Rockford, Ill., an old and respected plumber, has sold out his business and good will to Wm. Durham, of the same city. Mr. Henderson will remain in the city for some time, after which he will travel to seek health for his wife. Mr. Henderson does not intend to enter into the business again, having ample means to keep him comfortable for the rest of his life. Mr. Durham has moved into his elegant new quarters, 125 Main street, having opened the first complete show room in the city. He reports the outlook very flattering.

The many friends of Mr. Springer, of the firm of Springer & Gregory, of Rockford, Ill., are pleased to see him able to be around attending to his usual business routine, although he has to be supported on crutches.

J. S. Davis, ex-foreman for James Woodruff & Co., Rockford, Ill., has opened a shop and is doing nicely. James Woodruff & Co. having practically given up that part of their business.

Harry Morris & Co., Racine, Wis., are doing an immense business this spring, having also some good contracts in Burlington and Dalavan, Wisconsin.

Mr. Burr, of Burr Bros., Kenosha, Wis., has just returned from an extended trip through Central America.

A plumber was standing watchfully by
While a tinner was putting an S-trap in;
He placed the trap square upside down
And wedged it in his pipe of tin.
"And this is why," the plumber said,
"They call us robbers and thieves;
The tinner turns loose on the ignorant folk,
And this is the job he leaves."

The strike is still on in full blast in this city and a number of journeymen are seeking work in the country. In attempting to overtake an electric car last Friday I slipped on a cobble stone

injuring my knee so as to be compelled to stay off the road for a few weeks.

The plumbers of Dubuque, Iowa, have gone out on a strike. They demanded of the bosses an eight hour day at the present rate of wages, and being refused, quit work.

The National Association of Master Plumbers will convene in their ninth annual convention June 23, at Cincinnati. The Association has made great progress during this year, and the coming convention should be made the greatest ever held.

Where the proper authorities will not provide laws and regulations governing plumbing for the greater security of the public health, the plumbers might attain this end and serve the public good by agreeing among themselves to do only that kind of plumbing work which would meet the requirements of health.

The tinker had finished a Cheap John job
And snugly fobbed his ill-gotten pay;
But the owner sickened with sewer gas soon,
And the sun went down on his wrath that day.

The Texas Master Plumbers Association will hold a convention at San Antonio the 13th of this month, and on the 14th the San Antonio plumbers will spread a banquet for the guests. The Texas plumbers are coming to the front fast, and the result of President Griffith's visit to the Lone Star state is very gratifying.

Fred Adee & Co., of 92 Beekman street, New York, are completing alterations in their building which will increase its appearance in attractiveness. The office will be moved back and the front on Beekman street will be handsomely fitted up and used as a showroom for their fine plumbing goods and sanitary specialties.

If your plumbing needs inspection
Get a plumber sure to do it.
Otherwise you'll breathe infection
And be always sure to rue it.

Plumbing work is not a toy; it is a very serious matter, and none but reputable plumbers should do it. The public must learn this before it will be able to protect itself against the imposition of the jerry builder with his cheap plumbing.

A man may be a hustling ward politician and ignorant regarding almost everything, but when it comes to inspecting plumbing it is a very different matter. He has to understand his business or the people will be made to suffer.

"Will you walk into my parlor?"
Said the spider to the fly,
'Tis the prettiest little parlor
That ever you did spy."
"No, indeedy," to the spider
Said the watchful little fly,
"For a tinner did your plumbing,
And if I enter I will die."

The man who declines to employ an efficient plumber to do his work, stands a good chance to employ a physician at a much higher price.

The Chattanooga plumbers are out on a strike, and about all the building trades of the city have quit work for some cause or other.

The petition which the master plumbers of Providence, R. I., have submitted to the Government asking to be relieved from furnishing bonds has stirred up more or less opposition among property owners. The laws relating to house drainage provide that the Board of Health shall issue licenses to plumbers for one year. Every person or firm to whom such a license is granted is required to give a bond to the city in the sum of $1,000, with sureties approved with the health authorities, for the satisfactory performance of all work. No persons are allowed to carry on business unless they have obtained a license. Before the new laws were passed master plumbers were required to give bonds of $2,000 as a guarantee that the streets in which sewers and water pipes were laid would be properly cared for, and it was stipluated that an extra bond of $1,000 should be filed with the water department to insure approved work. In addition to these bonds of $3,000 a bond of $1,000 is now required to guard against defective house drainage. The judges of the work are the Inspector of Plumbing and the members of the Board of Health. The plumbers object to the restrictions, but it is doubtful if their objections are sustained.

The Health Board of Indianapolis, Ind., has prepared the plumbing inspector ordinance, and has presented it to the Council. The ordiaance provides for the registration of master plumbers and journeymen, creates the office of inspector, providing that before he shall take office he shall be examined by a board of practical plumbers doing business in this city. He will examine all plans for plumbing, all new and old buildings in which there is plumbing, and keep a record of all examinations. It defines and regulates all classes of work, specifying the kind of material, size, of course, of pipes, etc. It requires registration fees, and inspection fees, the latter based upon the value of the work to be done. Each contractor inapplying for a permit to plumb a house is required to certify the work's value.

Silent and sullen a microbe sat
On the sewer side of a strong house drain;
And as he sat he sang a song
And this was his sad refrain:
"Blast the plumber and blast his work,
Keenly the point of his skill I feel;
For I am shut out of the homes of men
By the bend of his pipes and water seal.

The St. Louis Master Plumbers' at their meeting last Tuesday evening, elected the following delegates to the Cincinnati convention: Joseph T. Gallegher, Jeremiah Sheehan, M. J. Ward, O. G. Gerhard, William Morris, Joseph Tumalty, John F. Reardon, William Norris, Patrick Madden, E. P. Reardon, John McMahon, William Scherehr, T. McLaughlin, James Lancaster.

WHERE PLUMBING WORK IS BEING DONE.

5031 Ashland ave., J. J. Curtin; 492 Adams street, A. A. Campbell; Armitage ave. east of Jefferson ave., Bayha & Bachman; 5438 Atlantic, W. F. Merz; 5314 Aberdeen, M. Stack; 564 Armitage ave., H. Breyer; Aberdeen bet. 50 and 51, E. D. Werner; Albany ave. north of Twelfth, C. Kostlevy; 6344 Aberdeen, A. Miller; 719 Bloomingdale R., Harvey & Mose; Byron ave. west of Mozart Garner & Bahn; 1310-20 Burchell, Garner & Bahn; Byron ave. south of Belmont, Garner & Bahn; 611 Baker, A. Miller; Bissell and Centre, Jeschky; 15 California ave., Steiner & McFarlane; Centre ave. bet. 67 and 68, J. B. Sheville; Cloud Court and Butterfield, T. N. Kuhn; 359 Clark, McDonald; Church Road near Clark, Thoroughgood Co.; 228 Courtland, H. Breyer; S. Chicago and Sixty-seventh, D. Walsh; 31-33 N. Canal, J. L. Pattison; 120 DeKalb, W. Daniels & Co.; 484 Dudley, H. Breyer; 850 Division, Gruschow & Co.; Dobson ave. bet. Seventy-first and Seventy-second, J. P. Thompson; 540 Dearborn, Thompson; Drexel boul. and Seventy-second, D. Walsh; Davis and Potomac ave., Nelson & Ceelhoffen; 7008 Emerald ave., P. Schmidt; Emerald near Seventy-second, Cotler & Son; Evans ave. and Sixty-seventh, D. Walsh; Evans ave. and Seventy-fourth, D. Walsh; 1643 Elston ave., Garner & Bahn; 110 Eleventh, C. Kostlevy; Forty-ninth and Michigan ave., T. N. Kuhn; 329 Fifty-ninth, J. B. Sheville; Forty-seventh east of Wallace, C. J. Boyd; 1008 Fiftieth, C. J. Boyd; Fifty-first Court east of Morgan, C. J. Boyd; Fifty-second west of Peoria, C. J. Boyd; 273 Fairview ave., H. Breyer; 336 Forest ave., Garner & Bahn; Greenwood ave. bet. Forty-fourth and Forty-fifth, Sims & Son; 355 Homer, Harvey & Mose; 431 Hermitage ave., F. N. Kuhn; 630 Holt ave., H. Breyer; Hancock and Wabansia ave., Garner & Bahn; 1041 Kedzie ave., Garner & Bahn; 3252 Lowe ave., Herzog; 1566 Lexington ave., E. M. Hackett; 724 Logan, M. Stack; Lake ave. and Fifty-fifth, Moylan & Allcock; Lake and Desplaines, O. F. Russell; Linden north of Fullerton ave., Garner & Bahn; 113-115 Miller, Love & Liebold; Malteson west of Wallace, C. J. Boyd; McChesney, D. Walsh; 226 Myrtle ave., H. Breyer; 1001 Madison, McDonald; 1218 Mariana, J. Schuer; 5333 Monroe ave., J. J. Rourke; 457 Ogden ave., T. Bunting; 1730 Oakdale ave., F. Neustadt; 49 Oakley ave., A. W. Murray; 2636 Oakwood ave., Colter & Sons; 6945 Oglesby, E. Sheehan; 110 Ogden ave., W. C. Breen; Portland and Twenty-seventh, J. H. Killean; 399 Park ave., Love & Liebold; 130 Park, J. J. Geiss; 5631 Paulina, M. Stack; 6849 Peoria, M. Stack; 41 Point, H. Breyer; Palmer, G. Franklin; 979 Rockwell, H. Breyer; Randolph and Jefferson, J. J. Wade; 635 Root, M. Weber; Southport ave. and Nellie, F. Neustadt; Simons ave., J. J. Geiss; Seventy-sixth

and Madison ave., D. Walsh; 4235 St. Lawrence ave., T. B. Armstead; 2833 Shields ave., J. Teutsch; 4454 School, A. Miller; 1725 State, R. J. Levy; Sixty-ninth and Sherman, Lyon & Lee; 6648 State, Stewart; Sixty-ninth and Halsted, F. N. Kuhn; Shields ave. cor. Twenty-third, M. Weber; Seventy-first and Woodlawn ave., G. Thompson; Sheridan ave. and Humboldt Park, Garner & Bahn; Sheridan ave. and Belmont, Garner & Bahn; Sholto and Polk, C. Kostlevy; 890 Turner ave., P. Beckler; 779 Taylor, James Walsh; Thirty-second and Halsted, Love & Liebold; 195 Thirteenth, W. H. Rustman; 542 Thirteenth, Kretchmer & Kurz; Turner ave. bet. Twenty-fifth and Twenty-sixth, W. Daniels; Turner ave. bet. Twenty-third and Twenty-fourth, W. Daniels; 224 Taylor, G. A. Tehr; 539 Twenty-fifth, M. Weber; 512 Union, W. H. Rustman; 156-160 Van Buren, J. Connell; 105 Vedder, Bayha & Bachman; 465 Wood, C. T. Klentz; 530 Washington, McDonald; 49 Winthrop ave., W. Bletch; 5617 Winter, P. Schmidt; 5141 Wall, J. Teutsch; 1153-55 Western ave., W. P. Rankin; 4403 Wentworth ave., J. Teutsch; 609-611 Wells, Val. Ruh; 6728 Wabash ave., S. W. Shiner; 6814 Wentworth ave., L. Clark; 521 Washburn ave., John Watson; Winter and Sixty-eighth, D. T. Daniels; 888 Washtenaw ave., Harvey & Mose; 5426 Wentworth ave., J. Teutsch; 647 Western ave., T. Bunting; 4648 Wabash ave., Sanders & Boylan; 6722 Winter, Lyon & Lee; 992 Wood, Harvey & Mose; Walton ave. and Sixty-third, D. Walsh; Wood cor. Hinman, J. Walsh; 859 Washtenaw ave., H. Breyer; 808 Washtenaw ave., Nelson & Ceelhoffen; Wells and Pearson, E. Baggot.

FOR THE DIGESTION.

"Another presidential possibility," sighed the political writer. "What's his name?"

"Don't know yet. He only arrived last night. Weighs ten pounds."—*St. Joseph News.*

"Will He Marry Her?" is the title of a serial story. What is the jury's verdict?—*New York Recorder.*

When a woman wants to drive anything out of the house she "shoos" it. A man usually boots it.—*Yonkers Statesman.*

Stranger—"I have 300 burglar alarms I'd like to sell you." Hardware Merchant—"Do you manufacture them?" "No, sir. I am a burglar."—*Detroit Free Press.*

Watts—"I saw one man made happy yesterday." Potts—"Who?" Watts—"Fellow with a new twelve-dollar suit on. Small boy called him a dude."—*Indianapolis Journal.*

"Yes, he died a natural death. He just went from one sleep into another till he fell into the last sleep." "What was deceased's occupation?" "He was a policeman."—*Epoch.*

It seems to be one of the rules of an ice company that the purchaser pays for what he would have received if he had hurried up and got ahead of the thaw.—*Washington Post.*

Briggs—"Poor Robinson. After his wife died he married her dressmaker." Griggs—"How are they getting on?" Briggs—"I understand that he still owes her the money."—*Clothier and Furnisher.*

Inkers—"I see you took in Niagara Falls on your wedding tour." Winkers—"Y-e-s; I noticed my wife hadn't the first notion of how much it costs to live, so I spent a week there."—*New York Weekly.*

It is claimed by the proprietors of a new hair remedy that the race of bald heads will entirely disappear. We cannot see how this can be unless the nostrum will prevent matrimony.—*Texas Siftings.*

How can you expect to get information from a letter when it is not posted?—*Yonkers Statesman.*

Carruthers—"Filkins seems to regard himself as a hero; on what grounds, I wonder?" Waite—"He has no valet."—*Puck.*

Parrott—"How many great titles end in 'or'—emperor, legislator, editor——" Wiggins (who lives in a flat)—"Yes, and janitor."—*Harper's Bazar.*

Average woman—"What? Not going to church today?" Average man—"What's the use? Our new preacher is so near-sighted he can't tell whether we're there or not.—*New York Weekly.*

"Have you had the grip?" asked one Washington citizen of another. "Grip!" was the reply. "I should say so. It seems to me that I have had two or three cable cars and a power house."—*Washington Post.*

"When you lose your office," said the good old man to the politician, "I trust you will not alter your habits of industry and take to drink." "No, sir, said the politician promptly; "I'll change my politics."—*New York Recorder.*

Sam Beck, '93—"Freshleigh won't give me the pipe I matched him for last night." Jack Matthews, '92—"Why not?" Sam Beck—"I don't know. Perhaps it is because I used a Chinese coin and called the hole heads."—*Harvard Lampoon.*

Dr. Pellette—"I tell you, homeopathy is gaining ground right along." Dr. Bowless—"Yes, there's the faith cure, for instance You get an imaginary disease and then cure it by a dose of imagination."—*Indianapolis Journal.*

Landlord—"I'm going to raise your rent, Mr. Clark." Clark—"Why, rents haven't gone up, have they?" Landlord—"No, but I see you've been making some improvements on the house. That, of course, ought to make it bring more rent."—*Yankee Blade.*

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: H. P. Harned has prepared plans for a 4-story and basement store and apartment house, 117x120, for A. A. Turner, to be built at Forty-seventh street and Vincennes avenue; cost, $100,000. William Thomas has about completed plans for a 2-story school building, 120x60, to be erected in connection with the Normal school at Valparaiso, Ind., by H. B. Brown; cost, $50,000. F. B. Abbott has planned a 4-story apartment house, 46x125, for R. P. Prosbasco, to be erected at Stanton avenue and Oxford court; cost, $50,000. Theodor Lewandowski has planned a 4-story store and flat building, to be built on Hoyne avenue near Lubeck street; cost, $15,000. For J. Thomson he has also planned a 4-story addition at Clinton and Madison streets. Faber & Pagels have designed a 3-story basement and attic flat building for O. Manland, to be erected on Carpenter street; cost, $8,000. Also for M. Renehan they have planned a 2-story and basement store and flat building; cost, $8,000. J. C. Brompton has planned a 2-story basement and attic flat building, 611x14, to be built at Normal park, by Dr. L. W. Beck; cost, $30,000. Oliver W. Marble has planned a 3-story and basement residence for Joseph P. Wathier, to be erected on West Monroe street. George Grussing has planned a 2-story and basement store and flat building for A. P. Miller; cost, $5,000. Also for L. & O. Kolb he has planned a 3-story and basement store and flat building, to cost $16,000. Thomas W. Wing has planned two 2-story basement and attic dwellings, to be built on George avenue near Evanston, by George Branckman; cost, $15,000. W. A. Arnold has planned a 2-story frame residence for W. G. Wanzer, to be erected at Evanston. Lamson & Newman have planned a 3-story and cellar residence, to be erected at the corner of Adams and Leavitt streets, by Mr. M. E. Ingrahms; cost, $12,000.——Philadelphia, Pa.: John Stafford, of 1606 Susquehanna avenue, will build fifty-four houses to cost $70,000. The plans for a hall to be built at Conshohocken, Pa., for the Patriotic Sons of America, Camp No. 121, are now being prepared by Architect T. P. Lonsdale of this city. Architect Isaac Purcell has prepared drawings for a 4-story fireproof hall to be built at Broad street and Ridge avenue for M. M. Owens. The congregation of the church of St. Martin at Oak Lane has contracted with B. Frank Livezey for the erection of its new edifice. A 4-story business house, 32x128 feet, will be erected on the west side of Second street north of Chestnut, by S. B. McDowell. At the southwest corner of Nineteenth and York streets a 2-story church, 60x100 feet, will be built by S. A. Mutchmore.——Detroit, Mich.: Geo. A. Depew has prepared plans for a 2-story brick residence, stone trimmings, on north side Trumbull, between Kirby and Hudson avenues, for Wm. Gray, Esq., to cost $5,000. George W. Meyers has prepared plans for a brick 3-story store and flats building on north side Macomb, near Hastings street for Casper Schultz, Esq., to cost $5,000. Harry J. Rill has prepared plans for Thomas Armstrong, on Woodward avenue, near Edmund place, to cost $11,000. E. E. Meyers has prepared plans for the remodeling of

business building on south side Jefferson avenue, near Shelby street, for Rev. D. M. Cooper; cost, $7,000. Hess & Raseman have prepared plans for a block of 3-story brick stores, with stone trimmings, on Gratiot avenue, near Hastings street, for Joseph Parrien; cost, $12,000. Henry Englebert has prepared plans for a 2-story brick (pressed) store and flats building, on Michigan avenue, near Humbolt, for Anthony Kaiser, to cost $12,000. Malcombson & Higginbotham have prepared plans for the Disciples of Christ Church Society, to be built on the corner of Fourth and Plum streets; also plans for a 2-story residence on Ferry avenue, between Woodward avenue and John R. street, for Wm. A. Pungs, to cost $12,000. The same architects have prepared plans for the Cass avenue M. E. Church Society of a stone church, corner Cass and Selden avenues; cost, $25,000; also plans for the First Congregational Society of Owasso, Mich., to cost $25,000; to be built of stone. Gearing & Stratton have prepared plans for enlarging residences for F. E. and E. J. Smith, on Laurel street; cost, $5,000. J. G. McLaren, of Windsor, Ont., has prepared plans for Windsor & Sandwich Car Co., for barns, to be built of brick, 142x50; cost, $5,000. A. C. Varney & Co. have prepared plans for a 2-story double brick residence, on north side Rowena street, between Woodward avenue and John R street, for Eberts Bros.; cost, $9,000. The same architects have prepared plans for the remodeling of business building on Michigan avenue for R. W. Allen; cost, $5,000. The same architects have prepared plans for a 2-story brick residence, stone trimmed, slate roof on Forest avenue, between John R and Woodward avenue, for W. A. Butler, to cost $6,500. The same architects have prepared plans for a 2-story brick, cut stone trimmings, slate roof, on Forest avenue between Second and Third streets, for Judge P. F. Van Zile; cost, $5,000. The same arthitects have prepared plans for John Grindley of a 2-story brick residence, on Forest avenue, between Second and Third streets, to cost $5,000. The same architects have prepared plans for John Alley of a 2-story pressed brick residence, with stone trimmings, slate roof, on Alexandrine avenue, between Woodward avenue and John R street; cost, $5,500. The same architects have prepared plans for a 2-story brick residence, with stone trimmings, slate roof, on Forest avenue, between Second and Third streets, for Frank E. Robson; cost, $5,000. A. E. French has prepared plans for two 2-story residences, corner Alexandrine avenue and 8th street, for S. W. Hood; cost, $6,000. Donaldson & Meier have prepared plans for a church on McDougall, near Willis avenue, to be built of brick for Roman Catholic church; cost, $30,000. Mortimer L. Smith & Son have prepared plans for 2-story residence, on north side Ferry avenue, near John R street, for Wm. L. Barllay; cost, $12,000.——Anniston, Ala.: The Congregational church corner Fifteenth and Mulberry streets will be rebuilt. Address Rev. Jas. Brown, or G. W. DeArman, 1505 Pine street, for particulars. ——Huntsville, Ala.: The Baptists contemplate building a church. Address M. B. Neece.——Bridgeport, Conn.: Henry A. Lambert & Co. are to prepare plans for another large brick addition to the factory of the Holmes & Edwards Silver Company on Seaview avenue.——Meriden, Conn.: Architect H. M. Jones has the drawings for Dr. Chapin's new house on Main street; the house will be of rock faced brownstone, trimmed with Longmeadow red stone; the first story will be of terra cotta, rock-faced ashlars, and trimmed with smooth brownstone, and the second story will be shingled.——New Haven, Conn.: Architect R. G. Russell has completed the plans for a 3-story brick building to be erected on the corner of Dixwell avenue and Webster street for Schadee & Pohlman; the first story will have granite trimmings and the second and third pressed brick; to cost about $8,000. Allen & Tyler, architects, have finished the plans for a new public library at Guilford; it is to be a 2-story frame building, 35x50, with shingle roof, and will cost $5,000.—— Waterbury, Conn.: Architect Jos. A. Jackson is preparing plans for a frame block to be built on Hayden street by P. H. Walsh; the building will be 40x62, three stories high.——Superior, Wis.: Architect W. T. Towner is preparing plans for a $6,000 house for E. H. Brooks, and one for Alderman McEachern to cost $10,000. The same architect is engaged upon plans for a $50,000 church for the Methodist Episcopal Church.

HEATING AND LIGHTING.

New electric light plants or extensions of existing systems are reported as probable in the following places: Harlan, Ia., address F. L. Burrell, of Fremont, Neb.; Redlands, Cal.; Central Falls, R. I.; Wilmington, O.; Beeville Tex ; Thompsonville, Conn., address W. G. Bushnell, of New Haven; Santa Fe, N. Mex.; Mansfield, O., address the Electric Street Ry. Co.; Lake Charles, La., address A. L. Roberts; Chattanooga, Tenn., address Hartford, Herbert & Co.; Ennis, Tex., address M. Latimer, Mineola, Tex.; Newport News, Va., address the Newport News Light and Water Co.; Norfolk, Va., address G. W. Taylor; Bardstown Ky., address A. R. Carothers; St. Clairsville, W. Va.; Broken Bow, Neb.; St. Ignace, Mich.; Roseland, Ill.; Worthington, Minn., address F. Lewis; Greenville, Pa.; Merrickville, Ont.; Tarkio, Mo.——Vassar, Mich.: The bill authorizing Vassar to issue $10,000 of bonds for an electric light plant has been signed by the governor.—— Charleston, W. Va.: Cleon Moore, B. D. Gibson, P. C. Kennedy and others have incorporated the City Electric Light Company to furnish light and power. The capital stock is not to exceed $50,000.——Pulaski, Tenn.: G. T. Oakes can give information regarding an electric light plant.——Seattle, Wash.: The authorities have under discussion the establishment of a municipal lighting plant at an estimated cost of $75,000.——Nashville, Tenn.: D. B. Cooper, G. H. Witworth, P. P. Pichard and others have incorporated a company to construct and operate an electric light plant.

SEWERAGE NOTES.

Worcester, Mass.: There will be a number of sewer extensions; 12 and 18 inch pipe, 26x39 inches to 32x48 inches brick.—— Middleboro, Mass.: $5,000 additional has been voted for sewers. ——Buffalo, N. Y.: The City Engineer is preparing for work on new sewers, and proposals will be advertised for very soon.—— Middletown, N. Y.: $2,500 will be spent on surface drains.—— Holly, N. Y.: A system of sewers is proposed.——Plainfield, N. J.: The sewerage bill has been signed by the governor.—— Punxsutawney, Pa.: Surveys and estimates are being prepared for a system of sewerage. If too expensive for the borough, a franchise will be granted to the company.——Reading, Pa.: $25,000 has been appropriated for sewers.——Roanoke, Va.: The City Engineer estimates the cost of the intercepting and overflow sewers proposed by Mr. Hering at about $91,500. The intercepting sewer would be about 8,250 feet long. The National Sewerage Co.'s prices for the West system are $8,500 per mile for ten miles, $5,000 per mile additional; 25 cents per cubic yard additional for rock excavation.——Manchester, Va.: The Street Committee has recommended that Col. G. E. Waring be engaged to prepare plans for sewerage. A preliminary expenditure of $30,000 is proposed. Columbus, Ohio: The cost of sewerage for the West Side is estimated by the City Engineer at $225,800.——Alliance, Ohio: It is proposed to spend $30,000 on sewerage for the First and Second wards.——Hamilton, Ohio: Address L. Dillon, city engineer for particulars regarding a proposed system of sewers.——Butler, Ohio: Plans for a system of sewerage have been adopted.—— Winnetka, Ill.: The new board of Village Trustees will probably take steps to provide a system of sewerage.——Baker City, Ore.: A sewerage system is proposed at a cost of $30,000.——Stockton, Cal.: The city has appropriated $85,000 for sewers. Mr. G. A. Atherton, city engineer, can furnish information.——Texarkana, Ark.: A sewerage system is wanted.——Washington, D. C.: A large mileage of main and pipe sewers will be laid during the coming fiscal year.——Kittaning, Pa.: A system of sewers is proposed.——Bath, Me.: Thomas Aspinwall, city engineer, is making an inspection of the sewers with a view to preparing plans for an improved system.——Greeley, Col.: Bonds for $10,000 will be issued for drainage.——Lowell, Mass.: The Sewer Committee has authorized the construction of numerous additional sewers. Alderman Tilton can furnish particulars.——Windsor Locks, Conn.: The question of a sewerage system is again being agitated.—— Wilmington, Del.: The sum of $160,000 will be expended on sewerage and other improvements during the present year.

WATER WORKS NOTES.

Goffstown, N. H.: Water works will be built at an expense not to exceed $30,000.——Cincinnati, Ohio.: The Board of Public Improvements has adopted the ordinance to issue $200,000 in bonds for water works purposes.——Huntington, N. Y.: The Town Board has adopted a plan to establish a water works system. The Supervisor can furnish particulars.——Alexandria, La.: The Mayor of this city is chairman of a committee which is to investigate the question of establishing a system of water works.—— Madison, Ga.: A system of water works will be built.——Grand Rapids, Mich.: The proposition recently made to the Board of Public Works for water supply for this city has been referred to the special committee on water works, which will report upon it, and, upon the suggestion of the Board, the people will be asked

to vote on a proposition to borrow $300,000, with which to lay nearly 34 miles of mains on 105 different streets, in extension of the present system, requiring about $148,000 of the proposed total sum; the balance to be used in securing the new and additional water supply. The President of the above Board can furnish particulars.——Saginaw, Mich.: $100,000 will be spent in extending the water works system on the west side of the river.——Mayville, N. Y.: Town Clerk Frank Burns can furnish information regard to a contemplated system of water works.——Batavia, N. Y.: Geo. P. Smith is president of the Michigan Pipe Company, which proposes to furnish the village with water for fire and domestic purposes.——Whitestone, L. I.: The people will equip and maintain their own system of water works at a cost of $45,000 for construction purposes. Address Dr. Bleecker, of the Board of Water Commissioners, for information.——Columbus, Miss.: 2,500 feet of new 6-inch mains are to be laid.——Tacoma, Wash.: Capital is being secured for the new citizens water works company.——Rochester, N. H.: The State Legislature has authorized the town to construct water works.——Reading, Pa.: $150,000 will be spent in replacing the small mains with larger pipes and making other repairs.——Buffalo, N. Y.: The South Buffalo Business Men's Association urges the necessity for a better water supply in that part of the city. About $50,000, it is estimated, would be required to lay the necessary mains.——Niles, Ohio: Water works will be built.——Champlain, N. Y.: The Village Trustees are considering the question of water works, and estimate the cost at about $18,000.——Midway, Utah: The citizens are subscribing to a fund for the establishment of water works.——Dartmouth, N. S.: $100,000 will be spent for water works and a sewerage system.——Waitsburg, Wash.: A mass meeting of citizens has declared in favor of putting in water works.—— Erie, Pa.: It is proposed by Superintendent O'Lone of the water department, to lay about seven miles of mains this season.: Spokane, Wash.: The city council has recommended issuing $400,000 of bonds for water works.——Crocket, Tex.: A movement is on foot to establish a system of water works.——Bridgeport, Ohio: The question of issuing bonds for works will soon be voted upon.——Danville, Ind.: J. O. Parker is president of the Natural Gas and Water Co., which proposes to supply the town with water.——Winnetka, Ill.: A water supply from the Evanston works is under consideration.——Manson, Ia.: Plans for works are to be made by A. West, Elgin, Ill.——Northfield, Minn.: Works are proposed. The city has the power to issue $40,000 for internal improvement bonds.——Aurora, Mo.: W. R. Hamilton, city clerk, can furnish information in regard to proposed works.——Dillsburg, Tex.: Works are projected.——Itasca, Tex.: A system of water works is contemplated.——LaGrange, Tex.: The town hopes to build combined water works and electic light system this summer at a cost of $30,000.——Astoria, Ore.: There is a talk of a new water supply system. W. E. Dement, city clerk, can furnish particulars.——The Dalles, Ore.: Bids will be received until May 23 for the construction of a 370,000 gallon receiving basin, near Mill Creek, about four miles from the city, also for 21,800 feet of trenching for a 10-inch wrought iron supply main. The contract for the above length of pipe has been awarded to Wolfe & Zwicker, of Portland, Ore.——Union, Ore.: The town proposes to build gravity works at an estimated cost of $20,000.

BIDS AND CONTRACTS.

Portland, Ore.: Bids are wanted for about 936 tons of pipe for distributing mains.——Aberdeen, Wash.: The city council invite proposals for the erection of a system for water works.——Baton Rouge, La.: Bids are wanted by the city for furnishing 2,000 candle power lights on a 5-year contract.——Elkton, Md.: Sealed proposals will be received until 6 P. M., May 15, for the construction and maintenance of a water works system on the franchise plan. George A. Blake is president of the Board of Town Commissioners.——Fulton, Mo.: The Board of Managers of the State Lunatic Asylum will receive bids until May 12, for the erection and completion of two fire-proof wings to the asylum.——Sweetwater, Tex.: The Commissioners Court, of Nolan County, will receive bids until May 11, for the tearing down and rebuilding of the court house at this place. Cost not to exceed $12,000.——Dallas, Tex.: J. C. O'Connor, President of the Dallas Opera House Company, wants bids for the remodeling of the opera house. Proposals are wanted until May 20, for furnishing a 10,000,000 gallon vertical pumping engine. Address D. A. Royner, City Engineer, as above.——Montgomery, Ala.: Proposals are wanted until May 18, 1891, for furnishing heating apparatus for two separate eight-room brick school buildings, one already built, the other in course of construction. Bids must be separate for each building and must state method of heating. Address Thomas H. Watts, Jr., chairman committee on schools.——Roanoke, Va.: Proposals are wanted until May 19, for the erection of the Academy of Music Building. Address Brothers, DeSassure & Waters, architects.——West Point, N. Y.: Sealed proposals, in triplicate, will be received until noon, May 20, for the erection of twenty sets (ten buildings of two sets each), of quarters for enlisted men at West Point. Address W. H. Miller, Capt. and A. Q. M., U. S. A.——Bristol, R. I.: Sealed proposals will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until May 20, for the labor and material and fixing in place complete the low pressure return circulation steam heating apparatus for the U. S. Cusom House building.——North Yakima, Wash.: Proposals are wanted until June 15, for the construction of a system of sewers at this place. Address F. M. Spain, city clerk.——Toronto, Can.: Proposals are wanted until May 19, for the construction of numerous sewers at this place. Address John Shaw, Chairman Committee on Works, as above.——Austell, Ga.: Bids are wanted for an electric light plant. Address C. J. Shelverton, Mayor.

EXCURSION RATES TO CINCINNATI VIA BIG FOUR ROUTE ACCOUNT.

NATIONAL UNION CONFERENCE FARMERS' ALLIANCE.

On account of the National Union Conference to be held at Cincinnati May 19th to 21st, excursion tickets will be sold via the Big Four Route May 18th and 19th, good returning until the 22d, at the low rate of one fair for the round trip. The excellent train service of the Big Four Route, together with through coaches, palace sleeping cars, and elegant dining cars make this the popular line to Cincinnati, and all who contemplate attending the Conference should ask for tickets via the Big Four Route. D. B. MARTIN, General Passenger Agent, Cincinnati, O. Ticket office 234 Clark street, Grand Pacific Hotel Block.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.
* * * *
But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

A VICTORY FOR THE WAGNER VESTIBULE.

The Wagner Palace Car Company, operating sleepers over the BIG FOUR ROUTE, has gained a signal victory in its controversy with the Pullman Company. By the decision just rendered by Judges Gresham and Blodgett, in the United States Circuit Court at Chicago, the motion made by the Pullman Company to enjoin the Wagner Company from the use of the "Vestibule" is denied, and the Wagner Company is sustained on every point it has made in the contest. This decision practically disposes of the litigation, and leaves the Wagner Company a clear field in which to demonstrate the superiority of its perfected Vestibule, which is now in use on all express trains of the BIG FOUR ROUTE, making the trains practically solid from end to end, an advantage which will be readily appreciated by the traveling public.

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SEWER PIPE.

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Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock, 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Reilly, Joseph & Bro., 517 W. Madison street.
Ruh Valentine, 548 Wells street.
Sanders, P. & Son, 1413 Wabash avenue.
Sullivan, John, 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN 25 years of age, eleven years' experience at plumbing and gas-fitting; considered a first-class hand, and a fast workman; have been in business for myself (up to Jan. 1st) nearly 5 years; understand drainage, drawing plans and estimating thoroughly; job in growing town in the South preferred. Must be steady. Address PHILADELPHIA PLUMBER, care THE SANITARY NEWS.

SITUATION WANTED AS TRAVELING SALESman in the line of plumbing or steam goods. Have had several years experience in retail store, can estimate any of this kind of work; strictly temperate. Address, R. B. this office.

SITUATION WANTED.—BY A YOUNG MAN who has had one year's experience with supply house in this city. Some expeaience with stock and is well acquainted with prices. Address R. J., care THE SANITARY NEWS.

SITUATION WANTED.—BY A YOUNG MAN as book-keeper in a plumber's office. Have had several years' experience in that line of business. Address, "M. F.," care of THE SANITARY NEWS.

WANTED.—A POSITION AS GENERAL SUPerintendent or foreman in plumbing establishment, by a Philadelphia practical plumber. One who understands the business thoroughly, and also the chandelier business. Has been in business and has been foreman in chandelier factory and has been plumbing inspector in Philadelphia. Can estimate from plans and specifications, and can draw plans. Address, W. 412 Greenwich St., Philadelphia, Pa.

SITUATION WANTED.—WITH MANUFACturer or Jobber in the supply business, by an unmarried man of good address. Have had seven years experience with the Plumbing and Steam Heating trade in the East and am rated as a salesman of ability. Can give reference. Address W. M., care of THE SANITARY NEWS.

SITUATION WANTED—BY A PRACTICAL man as book keeper in plumbing shop. Thoroughly understands the business. Address, F. D. GASSMERE, 3632 Wentworth Av., Chicago, Ill.

SITUATION WANTED—BY A YOUNG MAN to take full charge of a plumbing supply business. Has had ten years' experience and can furnish the best of references, as to character and ability. Address, "W," care THE SANITARY NEWS.

SITUATION WANTED—AS RETAIL GAS FIXture salesman, or plumber's book-keeper and collector. Might form a partnership with some practical plumber who is already established. Ten years' experience, abundance of references. Address, K. C., care THE SANITARY NEWS.

SITUATION WANTED—BY A PLUMBER, GAS and steam fitter; 22 years old; single; strictly temperate; served four years. Can furnish good references and would like work in or near Chicago. Address, "W. A. F.," care of SANITARY NEWS.

WANTED.—POSITION BY A GRADUATE engineer; three years experience in city work and one year as instrument man on railroad construction, fair draughtsman and letterer. Reference given. Address, Engineer, care THE SANITARY NEWS.

SITUATION WANTED.—By a married man, position as traveling salesman for plumbing, gas fixtures, or steam fittings; or would take charge of plumbing shop. Am a practical plumber and gas fitter. Have been in business. Can furnish satisfactory references. Address, "T. B." THE SANITARY NEWS.

SITUATION WANTED—BY A PRACTICAL water-works man; is a first class meter hand, having had eight years' experince on meters. Address, "Meter," care THE SANITARY NEWS.

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SITUATION WANTED.—POSITION AS FORman or traveling salesman with first-class establishment, or in speciality work of water closets; have been in the plumbing business twenty-two years; am forty years old and married; can furnish good reference. Address "Foreman" care THE SANITARY NEWS.

SITUATION WANTED.—PLUMBER'S BOOK Keeper; age 21, located with a prominent city shop; thoroughly understands the business: can estimate from plans and specifications. Reference: Present employer. Address A, 34 W. 60 St, New York City, N. Y.

SITUATION WANTED.—BY A YOUNG MAN as bookkeeper and collector in a plumbing shop; have some knowledge of figuring. Best of references. Address, "D," care THE SANITARY NEWS.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

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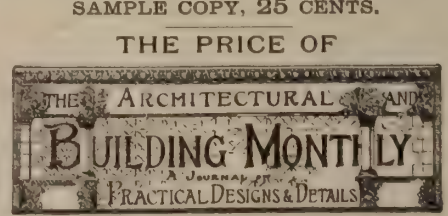

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1891.

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IT is right that plumbers should prosper. Their business should be a paying one. The honest, capable plumber well earns fair prices for his work, and the property can afford to pay more for good plumbing than for anything else. Besides, a prosperous and healthy business is better for the interests it serves.

IF the general public were as well educated in sanitary matters as the master plumbers of this country are, the sentiment regarding the plumber and his work would change. The truth is the plumbers are in advance of the people regarding sanitary affairs, and the people have not yet discovered that themselves instead of the plumbers are the delinquents.

IN most all of our larger cities the plumbing of to-day is a hundred fold better than it was ten years ago. It is in accordance with the best sanitary requirements, and it is stated on accepted authority that within this time, and as a result of sanitary plumbing, the death-rate has materially decreased in the cities wherein good plumbing has been secured. The people do not fully realize how great a boon that is to them, nor do they appreciate the fact that this is due to the efforts of the plumbers who have secured legal enactments which have made this department of sanitation possible.

WE naturally and rightly give praise to the physician who cures the ills that afflict humanity, but are slow to recognize and encourage the agencies which prevent disease. We know when we are sick and when we are cured, but fail to give credit to the means that prevents us from becoming sick.

MASTER STEAM FITTERS' ASSOCIATION.

The National Association of Master Steam Fitters will this year hold its annual convention at Philadelphia, commencing May 26. About three years ago this association was projected and definite direction given to its organization. It enters its field upon a basis and for purposes very similar to those on which the splendid association of master plumbers was founded. Trade protection is one of its objects, and up to this date of its existence the business interests of the trade have occupied chief attention. The object of the association in a business sense is to secure the rights of the trade in its relations with manufactures and dealers which are generally accorded to the trade in other vocations. It is to secure the rights the constant buyer should have above those of the casual purchaser. The association demands of the supply houses that its members be protected in the purchase of material in consequence of their large purchases and not be placed on an equality commercially with those who buy for their own private use. There is reason and a strong sense of justice in this demand, for if the trade patronize these houses largely as they do, it is not good business that they should not receive the full value of trade discounts, or that these should be allowed to persons who have no connection with the trade.

The trade is in a manner in the place of the retailer, and as such should receive the protection bestowed upon that class. Manufacturers and wholesalers do not offer the consumer the discounts given the retailer as their business prosperity depends on the patronage of the latter. The retailer purchases for the consumers and his large dealings entitle him to some considerations and pay for his services. So it is with the trade. Its members are purchasers for the consumers and their large and continuous purchases should entitle them to the full benefits their labor should bring them. This was the ground taken by the master plumbers, and on this basis business has been established between the supply houses and the trade.

While the master plumbers' association was working on these business lines, it was also devoting attention to the educational advancement of the trade and a further progress of scientific learning and mechanical skill. That it has succeeded so well in both should give hope to the master steam fitters, who, we are informed, propose to direct attention and the officers of their association to the advancement of the scientific requirements of the trade. Steamfitting, while it does not relate so closely to public health as does plumbing, does not depend alone on the mechanical skill of the workman. It is a necessary part of building construction and is one of the elements entering into the comforts and

health of the home, and the action contemplated by the association is commendable. All organization honestly projected for the advancement of business and industrial prosperity should be encouraged; for, with the development of business prosperity and financial energy, the trade or profession affected thereby, and which touches the great public interests, is provided better to serve these interests and contribute more substantially to the common good.

PROPER PROTECTION.

A long article appears in a contemporary setting forth in detail how to protect a house from destruction by lightning. The subject is treated scientifically and learnedly, and is a valuable treatise on electricity and its laws. In another exchange is an article dealing with the protection of houses from fire. Laws and ordinances are quoted regulating the construction of buildings, specifying the height, location, material, manner of construction, etc. This also is important, for these are proper precautions to take for the preservation of property and also life. No objections can be made to this care bestowed upon property which shelters homes and the great business and commercial interests of the country. Yet in some of these cities wherein specific laws are enforced insuring the greatest possible precaution against fire, there are no statutes providing for the preservation of health. While houses are protected from destruction by fire, homes are invaded by diseases which suitable laws properly enforced would prevent. While dwellings are properly shielded from destructive elements, the inmates are left exposed to disease which could be prevented by the same authority that enforces the ordinances against fire.

No one will say ought against the vigilance and care with which security against fire is affected; but it should not be surprising that the people should ask equal protection from disease and death. The greater should be the precautions against disease, for it is an unseen foe, while fire gives its own alarm and visibly announces its destructive presence. Disease on the other hand is silent, unseen and insidiously works its sorrow and destruction. There is no smoke, no light, no electric alarm, but the fire continues to burn until an epidemic sweeps over the city more terrible and destructive than a conflagration. It, like destructive fires, starts from a little spark that could have been prevented or easily extinguished were the proper means provided. The neglect of municipal authorities to be as cautious about disease as about fire has cost many a life that could have been saved as easily as the homes that sheltered them.

There is also this difference: We have never heard of an ordinance providing for fire protection being defeated. There may have been such cases, but we cannot now recall one. But how many ordinances providing for proper plumbing for instance, have been defeated or obstructed and delayed for years. Fire insurance companies recommend laws and draft ordinances for the better protection of property, but who knows of a life insurance company recommending the enactment of laws necessary to secure the simplest sanitary requirements for the promotion of health and the greater protection of life? Is property so much more valuable than life that it should receive the protection that life does not? The one is not incompatible with the other, and while we protect property let us protect life. The enforcement of wholesome sanitary laws is not difficult, and the authorities who will not secure this for the people are little less than criminally negligent.

WHAT IS THOUGHT OF IT.

The excerpts given below are from two of the leading journals of this country, and speak from a point of view commanding respect. They voice the sentiments of those truly interested in municipal and public affairs:

In the demoralizing clean sweep of city officials following the recent election of Mayor Washburne, of Chicago, that city loses one valuable officer in the person of Andrew Young, Chief Plumbing Inspector, who also had charge of the enforcement of the smoke abatement ordinances. His successor, a physician and ex-coroner, however capable an executive officer he may prove to be, can not be expected to fill Mr. Young's place as he did, since the latter was specially well qualified to enforce the plumbing laws intelligently and with firmness. He had the confidence of the best plumbers of the city and possessed the requisite technical knowledge and experience. It is a shame that in so many cities qualifications of this sort count for so little in the scale against a man's politics, for even technical positions.—*Engineering Record.*

The city of Chicago has lost a very capable official in the retirement of Andrew Young from the position of chief inspector of the Department of Health. It is unfortunate for the public service that the exigencies of partisan politics should be permitted to influence the selection of the incumbent of such an office. Mr. Young had not only proved himself capable, but he was furthermore rigidly honest and absolutely fearless in discharging his duty, which often involved disagreeable features in the enforcement of the city ordinances regulating plumbing and correcting the smoke nuisance. He can at least carry with him into private life the proud distinction of being the first smoke inspector who really succeeded in diminishing to a perceptible degree the volume of smoke poured forth from Chicago's chimneys.—*Metal Worker.*

NOTES AND NEWS.

The Cincinnati Board of Health has suppressed exhibitions of hypnotism upon the ground that they were prejudicial to the public health.

Mica, which stands unique among minerals as an insulating substance, is destined to become one of Connecticut's leading products. Three new mines have recently been discovered in that state.

The meetings of the Congress of American Physicians and Surgeons will be held in Washington from 3 to 6 P. M., September 22d, 23d, 24th, and 25th, 1891.

The authorities of the Ohio penitentiary have been using an electric shock for the purpose of punishing inmates. A legislative committee investigated, but did not find that any atrocities had been committed.

In Germany 5,500,000 women earn their living by industrial pursuits; in England, 4,000,000; in France, 3,750,000; in Austria, Hungary about the same; and in America, including all occupations, over 27,000,000.

One of the latest proposed applications of electricity is a policeman's club that contains a galvanic battery. When the rowdy seizes the club, thinking to wrest it from the policeman, the rowdy receives an electric shock, which astonishes and paralyzes him, rendering his capture easy.

Signor Manfredi, who has been studying the hygenic character of the surface of the streets in large cities, found that some of the mud and rubbish scraped up in Naples was so rich in bacteria that it might be compared to sewage. The most frequently-found bacilli are those recognized as specific to tetanus, œdema, and tuberculosis.

A special kind of paper has been invented which, it is alleged, is absolutely impervious to water, and will even stand boiling. The water-proofing can be carried out either after the paper is made or during the operation of making it.

A man has no more right to have a dangerous type of boiler under his sidewalk, or to keep a comparatively safe boiler in the dark, than he has to leave a loaded gun around when it is liable to be meddled with.—Grimshaw's "Hints to Power Users."

In an article on the danger of fire from steam pipes, in a German paper, it stated that after wood had remained a long time in contact with steam, hot water or hot air pipes, the surface becomes carbonized, and during warm weather the charcoal absorbs moisture; when again heated the moisture is driven off, leaving a vacuum into which the fresh air current, circulating around the pipes, rapidly penetrates and imparts its oxygen to the charcoal, causing a gradual heating and eventually combustion.

London *Engineering* says a heated controversy relative to the admixture of aluminum with steel is now in progress in South Yorkshire. It will be remembered that recently, in addressing the School of Metallurgy at Sheffield, Prof. Arnold announced the admixture of small quantities of aluminum with crucible steel, for its improvement, as a new discovery. Some of the melters resent this and state that aluminum has been used for the pro-

duction of finer grades of steel for twenty years past, though the fact has not been made public. Steel converters, as a rule, keep their admixtures a secret, and several of them assert that the professor has divulged nothing new.

KANSAS STATE ASSOCIATION OF MASTER PLUMBERS.

This association was organized in the spring of 1885. At the first regular meting in May, delegates were sent to St. Louis to attend the third annual convention of the National Association, held in that city June 23, 1885. Since its organization this association has grown steadily and has worked hand in hand with the National Association in defending the rights and principles of the trade in general. It is at present one of the most complete branches of the National body, it being in harmony with all the manufacturers and jobbers, and having on its roll of members every firm in the state, something the officers and members can point to with pride.

The following are the officers of this association: President, James Foley, Leavenworth; Vice-President, William Stockinger, Wichita; Secretary, C. J. Prescott, Topeka; Sergeant-at-Arms, C. C. Stewart, Hutchinson; Treasurer, Robt. Mood, Topeka.

Following are the committees:

Protection and membership.—Wm. Rowan, Arkansas City; F. W. Doane, Lawrence; F. H. Bowers, Emporia.

Auditing Committee.—Thos. Lloyd, Kansas City, Kan.; A. Buckridge, Wichita; J. E. Ford, Newton.

Executive Committee.—Jas. Foley, president, Leavenworth; Wm. Stockinger, vice-president, Wichita; C. J. Prescott, secretary, Topeka; R. Mood, treasurer, Topeka.

LIST OF MEMBERS.

Wm. Rowan, J. D. Love, P. J. Lyons, Alex. Bowen, Chris. Allen, F. H. Bowers, H. Ingham, S. J. Stewart, L. R. Loring, C. C. Stewart, Cooper & Merrill, Robt. Mood, Prescott & Allen, Chris. States, A. L. Snyder, Nooney & Co., Kansas Plumbing Co., Wm. Zeigler, Wm. T. Stewart, L. Bedoe, G. C. Hargraves, Thos. Lloyd J. F. Williams, Lawrence Heating & Plumbing Co., S. E. Johnston, Sidney Orme, James Foley, Leavenworth Plumbing Co., Hoffman & Bransfield, J. E. Ford, J. H. Beasley, John Sheahan, M. Dermody, J. A. Williams, G. W. Bennett, Wm. Stockinger, J. McDonald, J. W. Kline, John Hill, J. F. Sawyer, George W. Kite, C. J. Burrows, C. P. Nash, W. M. Hoffman.

JAMES FOLEY.

The subject of this sketch, and president of the state association, Mr. James Foley, is a native of Ireland. He came to this country with his parents and arrived in the city of Boston in the spring of 1848, being then a boy of seven years. He received a common school education, and, taking Horace Greeley's advice, came west in 1854. He arrived in the growing city of Chicago, and not caring to re-enter school he induced his parents to let him learn the plumbing and steam heating business. After spending a year at this business, he was apprenticed to the old plumbing firm of Brown & Boon, on State street. Part of this time he worked on the old Post Office building on Dearborn street.

After serving his time he went to St. Louis in the fall of 1859 where he was soon recognized among the best workmen, gaining the confidence of his employers and the good will of his fellow-workers.

When the war broke out he was an active member of the Sarsfield Guards, which company was about the first to be called out for state service. After a year's service he resigned his membership in the guards and went into the navy where he was employed putting in steam pumps in nearly all the gun boats and monitors that played an important part in assisting the land forces and opening up the Mississippi. He was sent with one of the monitors on her first trip, and witnessed the bombardment of Island No. 10. He was then sent back with one of the transports to resume his work.

After the war he again worked at his trade, being employed by Lunn & Malone of Memphis, Tenn., as their foreman, which position he filled until the cholera broke out in Memphis. He then returned to St. Louis, bought a stock of goods and in 1869 started in business with his brother. In 1876 he branched out for himself and has been carrying on the business successfully up to the present time. He is now in good circumstances and doing a large business; has one of the largest establishments in the state and carries a complete stock of plumbing and steam-heating supplies, which he encourages everyone in this business to do. He has done some of the largest contracts in the west, including a number of government buildings with steam heating and plumbing, where he has come in contact with some queer ideas from those in charge, and some most unsanitary specifications; in fact over-doing ventilation and exposing the house to the escape of sewer gas from outside vents. He is opposed to outside traps and outside fresh air ventilation from the house side of trap, as it discharges sewer gas through the return bend, called fresh air vent, and at every discharge of each and every fixture in the house, forces a volume of sewer and local gases out through this vent, the same to be returned to the house through the open windows or registers. This plan is used in a great many cities and towns and found in architects specifications. Mr. Foley believes in good sound sanitary plumbing and proper ventilation.

The plumber of to-day has to be a genius; he must not only master his own business but also be able to re-construct and make work the many worthless patents that are put on the market to the detriment of a good durable job of plumbing at cost of thousands of dollars to the trade annually. The more you compound and complicate a trap or water fixture the sooner it will become worthless, and find its way into the collection of the scrap pile,

Mr. Foley does not believe in newspaper education, or in plumbers and steam fitters applying to them for information and advice as to how to do a piece of work which an apprentice with six months' experience ought to know. Let those trespassers in the business find out for themselves or give up the job to some one who from experience understands it, and let them go into the training school for four or five years; then perhaps they will know without going into the newspaper business how to do their work, and not have to keep a customer waiting for the next issue of the paper before they can proceed.

After the second meeting of the National Association in Baltimore he wrote for a copy of the proceedings, and in this letter was detailed his policy in regard to the protection and elevation of our business to the position it now occupies in the commercial world. To his surprise the letter was answered and he got more than he asked for, being offered a state vice-presidency with instructions to organize. He went to work at once regardless of time or expense and perfected an organization in sixty days, and succeeded in holding a meeting and electing delegates to the third annual convention held at St. Louis. This association has proved a faithful ally to the National Association. After doing valuable service for three years as state vice-president he was unanimously elected as its president, and is now serving his second term in that capacity, but proposes to let some younger blood handle the craft. He is pleased with his association and watchful of its interests. The growth of this association, like the business in this state, would be double what it is but for the fanatical laws governing it,

causing dissatisfaction and the depressed condition of trade which bad laws have brought about. The people are hoping for a change in the near future which will put an end to the trouble, and place the state again on the road to prosperity, with her citizens enjoying the constitutional rights of a free republic.

Mr. Foley is very much interested in the good work and progress which the Chicago Master Plumbers are making in the interest of good plumbing and sanitation, knowing their ability and zeal in the cause. With the united support of the National Association, there can be no doubt that we will show to the world at the Columbian Exposition of 1893 that the plumbers of this land have advanced the art of plumbing and sanitation to as high an order as the world can produce.

FOR THE ADVANCEMENT OF PLUMBING.

The Davenport (Iowa) *Democrat*, in speaking of the convention of the Iowa State Master Plumbers, held the 5th inst, at Sioux City, enters into the spirit of the plumbers' movement and says:

The necessity of greater care and skill and scientific knowledge on the part of the plumbers who are entrusted with the important work of piping our offices and homes has been forced upon our observant and thinking citizens very frequently, and often in a most unpleasant manner. The botched jobs that are often done, to make trouble and demand repairs, call attention to this need in the most forcible manner. The fact that more than one case of serious illness, more than one fatal case in fact, can be traced to stupid plumbing, is sufficient to emphasize the demand of the public for a greater amount of skill and common mechanical and simple scientific sense in this line of work. The call for the licensing of plumbers as steamboat pilots and engineers are licensed, or as physicians and pharmacists are licensed, is too loud to be much longer unheeded. When a man buys a horse or a wagon or a suit of clothes or a gun or any other common article of necessity or luxury sold in the marts of the city, he ordinarily may be expected to know enough of the nature of what he is purchasing to protect himself against fraud. When, however, he employs a plumber to put in a system of water waste pipes for him at his office or his home, he engages that man for his special skill, as he takes a prescription to the graduate of pharmacy or goes to the graduate of medicine to procure it; relying upon the technical and scientific knowledge of both of them to do for him what he cannot do for himself. He has no means of knowing whether the druggist or the doctor are doing the right thing, except as he judges that work by its effects. He has just as little means of knowing of the character of the work of the plumber, and has just as good a right to insist that that workman shall be subjected to a rigid examination in the essentials of his trade, as he has to demand that the doctor and the pharmacist be compelled to undergo such an ordeal.

Those states that have taken steps toward legislative control of this matter are well satisfied with the results. There is no longer any room for argument on the proposition that poor plumbing has raised and good plumbing correspondingly decreased the death rate. The facts in the case will be brought to the attention of the next general assembly here in Iowa in such a manner as to warrant the assumption at this time that there will soon be laws covering the case here; laws that will be no injustice to any man, but that will be a protection and a blessing. And when these laws are passed the people who are to be benefitted by them may thank the health officers and public spirited physicians and intelligent plumbers who have sought to rid the community of an evil that has been harbored in its midst too long.

THE DOCTOR'S REVERIE.

Hark, hark, how we doctors laugh,
The bacteria are coming to town.
The bacilli and cocci,
The molds and the fungi,
Are poisoning the air all around.

Ho, ho, how the sea winds do blow,
All loaded with rheumaticky pains,
With backache and toothache,
With neuralgic headache,
And damp fogs a-chilling the frame.

He, he, the hot sun pleases me;
With its glare come fever and chills,
For the bugs are all "in it,"
They double each minute,
And give a big boom for my pills.

Ha, ha, just hear the rain patter,
As it fills all the cisterns with germs.
There's trouble a-brewing,
There's sickness a-stewing,
That'll bring all the folks to my terms.

Hi, hi, that wind suits my eye;
The people will all have the grippe,
There'll be coughing and sneezing,
And dosing and wheezing,
A chance that I'll never let slip.

O'er the plumber and ice man I'll dance a can-can,
And give the hotel man the bounce,
For mine'll be the dollars;
I'll have many callers,
And weigh out quinine by the ounce.

When the weather is wet I never will fret,
For the people are sure to catch cold.
Or, if the weather be dry,
I never will cry,
By ague I'll have sick ones enrolled.

Where or whenever, come good or bad weather,
The climate will always suit me.
The bacilli and cocci,
The molds and the fungi,
Will keep me in business, I see.

—*Southern Cal. Pract.*

HEALTH IN MICHIGAN, APRIL, 1891.

For the month of April 1891, compared with the preceding month, the reports indicate that dysentery and inflammation of bowels increased, and that cholera infantum, cerebro-spinal meningitis, inflammation of brain and membranous croup decreased in prevalence.

Compared with the preceding month the velocity, of the wind was less, the prevailing direction was west and south-west (instead of north), the temperature was much higher, the absolute humidity was considerably more, the relative humidity was slightly less, the day ozone was more, and the night ozone was considerably more.

Compared with the month of April in the five years 1886-90, influenza was very much more prevalent, and cholera infantum, measles, whooping-cough, puerperal fever, typho-malarial fever, cerebro-spinal miningitis intermittent fever, erysipelas, inflammation of kidneys, inflammation of bowels and diphtheria were less prevalent in April 1891.

For the month of April 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was slightly less, the prevailing direction about the same, the temperature was higher, the absolute humidity and the relative humidity were slightly more, the day ozone was about the same, and the night ozone was much more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of April 1891, at fifty-one places; scarlet fever at seventy-nine places; typhoid fever at fourteen places, and measles at one-hundred and four places.

Reports from all sources show diphtheria reported at one place less; scarlet feet at one place more; typhoid fever at three places less, and measles at six places more in the month of April 1891, than in the preceding month.

HENRY B. BAKER,
Lansing, Michigan, May 7, 1891. Secretary.

THE SANITARY ENGINEER AND HIS WORK.*

In using the title "Sanitary Engineer," I do so in its proper sense. I do not refer to the medical and other theorists, bankrupt builders, jerry builders, auctioneers, house agents and their assistants, upholsterers and their clerks, plumbers and their mates, the small gas-fitter around the corner, or the junior clerk

*A paper read before the Society of Architects by C. E. Gritten, A. M. Inst. C. E., March 24, 1891.

at the stores; all of whom have the effrontery born of ignorance to appropriate the title, or have it given to them by their equally foolish acquaintances. Do not let this be taken as in any way hostile to plumbers. The honest and capable plumber is the engineer's right-hand man in dealing with house sanitation, but the plumber who calls himself an "engineer," and the builder who styles himself an "architect," are almost invariably fools; at any rate they use names of which they do not understand the meaning. Surely never before was such a proud title so grossly prostituted! In this age of advertising monstrosities there is one pictorial advertisement for which the author must confess a liking. It recommends somebody's coffee, and advocates the good old English custom of calling "a spade a spade!" If the condiment is half as good as the axiom, it must indeed be of high quality. The definition of the profession of a civil (as distinct from a military) engineer, issued by the Institution of Civil Engineers, is, "The art of directing the great sources of power in nature for the use and convenience of man," and if we add the one word health, we have as good a definition of the profession of a sanitary engineer as we can desire. Sanitary engineering is only one branch of the grand profession of the civil engineer. The author has met with charlatans of divers kinds in the course of a busy professional life in different parts of Europe, but never has he met one at once more contemptible and more dangerous than the sanitary quack.

The sanitary engineer should be a professional man, of high character, just, but fearless. If not a genius, at least he should have that "boundless capacity for taking pains" in his work, which has been described as genius. Nothing should escape him. He must only believe a quarter that he is told, and about a half of what his eyes see, without the most careful examination and testing. He should have spent some of the best years of his life in obtaining the thorough theoretical and practical training which is *absolutely necessary* to enable him to honorably fulfil his important duties. He must never forget the grave responsibility resting upon him, and the high trust imposed upon him by those who rely upon his services for the health and consequent happiness of their homes. The old proverb "*Poeta nascitur non fit*," may be true of arts and letters, but it certainly is not true of the engineer, whether his life-work be sanitation or not. There is little work done by the civil engineer which either directly or indirectly does not come within the province of the scientific sanitary engineer. The value of a sound theoretical knowledge of the true principles of sanitation, as enunciated by Dr. Corfield and others, cannot be over-estimated, but this alone is of little use, unless supported by *training* and *practical* experience in sound construction, and the nature and uses of materials. Dr. Norman Chevers, F. R. C. S., a sanitarian of over 40 years' standing, in an address at Birmingham in 1884, after describing in a most graphic way some of the existing insanitary horrors in the land, and after encouraging his co-workers to persevere in "the good work patiently and humbly, expecting fair success, hardly and slowly earned," in the "God-strengthened war of mortal man against inevitable death," advocated the "appointment of a Minister of Public Health," invested with great powers, against which, all narrow self-interested opposition will be futile, and commanding large means. The result foretold being that "Nothing more will be heard of sewage-poisoned rivers, smoke and fog-blacked cities, or of public buildings and attractive suburban retreats constructed upon burial-grounds, quagmires, or abandoned lay-stalls," or refuse heaps.

The sanitary engineer should be a purely disinterested man; but just a word upon cost. Few things in this life can be obtained without money; and, as a rule, the better the desired object, the greater its cost. First-class drainage work is, and must be, expensive. The author has no patience with those who allow or do cheap, and consequently inferior, work in this connection. More than once has he been reminded by a builder excusing poor work, saying, "It is good enough," or "This is how we do it for such and such a surveyor," of a celebrated American divine's words to his son, "Hold yourself responsible for a higher standard than anybody else expects of you. Demand more of yourself than anyone else looks to you for. Keep your standard high. Be a hard master to yourself." Aim at doing your work not only as well as others, but a little better than them all. That is the way to get good work. The following extract from one of Dr. Corfield's lectures is so true and so valuable that I cannot help quoting it: "Against all sanitary improvements whatever, we find one argument continually brought—that things have gone on in the same way for many years, and that there is no reason why they should be changed, that our forefathers lived under insanitary conditions, and why should we not do the same? That cholera or enteric fever, or diphtheria has never broken out in a place, or in a particular house, and so it need not be expected! But these people forget that our forefathers died in these places, and that in all places which have been made cleaner, from which refuse matters have been removed more speedily, where overcrowding has been abated, where more efficient drainage arrangements have been carried out, the general death-rate has been lowered." In London, in the second half of the 17th century, the death-rate was 80 per thousand; in the 18th it had fallen to 50, in the first half of the 19th to 25, and it is now down to 17½ per thousand. The death-rate from zymotic diseases has fallen from 5.2 in 1840-50 to 2.24 in 1889. The death-rate rises enormously the more crowded the population is to the square mile.

Passing on to some practical details respecting houses, and dealing first with the testing of a house to determine its safety for habitation, the most important, and indeed the only satisfactory test for hidden pipes conveying fæcal matters inside, under, or near the houses, is the hydrostatic test, applied by inserting a Botting's or other plug in the main drain of the house at the lowest point, and quietly filling the whole system with water. Unless the water will stand up to the level of the highest gully for, say half an hour, no competent and responsible sanitarian will say that the drains are safe. To the objection sometimes made by the owner, and more frequently by the second-class house agent, that this test is "excessive," the reply is that it is the only engineering test known which is less powerful than the pipes may be called upon to bear in use afterwards. Let us see what happens directly the disconnecting trap upon the main drain becomes chocked—and they frequently do. Sewage fills the drains, the occupants of a house for a time being unaware of any stoppage continue to use the fittings, and many pounds weight of falling water apply a hydrodynamic test, falling as they do upon the sewage locked in the pipes, and water being incompressable the weak joint gives, and the sewage finds its way into or under the house—this soakage continuing in some cases for months or even years undiscovered, frequently illness in the house causing the first suspicion of anything being wrong. Total stoppages of this kind have been caused within the author's experience by oranges, chicken bones, hair, cloths, grease, and other foreign matters. So well is the fact recognized that even the most self-cleansing trap—for instance, Field's, Winser's Buchan's and Broad's—will sometimes become choked, that some surveyors have even suggested omitting them altogether. No attention should be given to the man who says, "These drains, although near to, are outside the house, and therefore I consider the water-test unnecessary." A warm house is very much like a sponge in water in its capacity for drawing in air through the walls, floors and every crevice. Experiments have been carried much further in Germany than they have in this country, in the matter of the movements of "ground air." The one thing certain is, that if there is an accumulation of sewage or sewage-polluted earth under or near an occupied house—aye, though there are 7 feet or more of ground above it—the foul odors resulting will be sucked into the house. Forcible proof of this have often occurred. Gas having escaped from a defective main in the road, many yards from a house, has gradually found its way into the building, and being ignited by some intelligent person looking for the "leak" with the aid of a match, with results disastrous alike to the investigator and the surrounding property. Concrete will not always stop this, as much concrete is of a highly porous nature. Another less common but useful test is the pneumatic. This is delicate, and not so easy of application. Oil of peppermint, paraffin, and other strong-smelling liquids are often usually employed. Ether has been tried, but is somewhat dangerous because of its explosive nature. The only proper place to apply a "smell-test" is upon the roof, by putting the medium into the ventilating pipe. The latest, and in

the author's experience the best, of this class of tests, is Banner's "grenade" or "drain-ferret." These have the advantages of extreme portability, and being hermetically sealed glass tubes there is no loss of the testing vapor, andthey are not so apt to mislead one as most "smell-tests." are. Not long ago when recommending a new and excellent sanitary fitting to a builder owner, who, by the way, called himself an "architect," the author was taunted by this individual as follows: "Oh! you say it is good because it is new!" The retort was unjust in this instance, but is not without teaching. For although inventors have the past to study, and should invent good things or none at all, it is not always so. Take an instance—the abominably filthy "pan-closet" was invented after the immaeasurably better Bramah valve closet. My reason for mentioning this is to caution all young sanitary engineers against accepting any appliances, new or old, on anything but its merits. Even after careful examination, study and criticism and of all its details by a competent man, practical use sometimes proves an unexpected weakness or defect to exist.

The Smoke-test—This may be applied by the "smoke-cases" made by Messrs. Pain & Brock, in a convenient manner, or by using a"smoke-machine." One of the best stands up on the table. It is made by Mr. William Dodds, R. P., of Baker street, and is beautifully compact. A greater volume and pressure of smoke may be obtained by using a machine. The "smoke-cases" were the invention of my old friend master, the late Mr. Cosmo-Innes, M. Inst. C. E., who did such noble work in the cause of sanitation.

(Concluded next week.)

CONVENIENT TO HAVE ABOUT.

Two coats of linseed oil make the best varnish for new copper work. The first coat should be thoroughly dry before the second one is put on.

In painting ironwork, exposed to wind and rain, take, says the *Mechanical World*, red oxide of iron, ground in oil, and mix it with equal parts of boiled linseed oil and turpentine, add one ounce of patent dryers to the pound. This is said to be a good paint for the purpose.

To prepare and fix crayon and charcoal drawings wash the paper over with size, and when perfectly dry, make your drawing. By holding your work over steam, the size and crayons combine, fixing your drawings. It may be repeated with advantage during the work.

The best material for paper stencils is a heavy manila paper. A day or two before using it, it should be tacked up somewhere and given a good coat or two of linseed oil. This renders it of requisite pliability. In cutting the design the edges should be laid on glass to secure smoothness.

Grease can be taken out of white marble by the application of whiting or fuller's earth saturated with benzine, and allowed to stand a little time after application. Another remedy is to rub well over the marble a mixture composed of two parts washing soda, one part ground pumice stone, one part chalk, all finely powdered and mixed into a paste with water, finally washing off with soap and water.

A very handsome effect is obtained in walls intended to be decorated by mixing an equal quantity of marble dust with the lime used in making the plaster. This gives a softness of tint which cannot be obtained with ordinary plaster. In Italy it has long been the custom to give a final coating of marble dust to walls intended to be treated by the wet process.

An improved lead headed nail for use in putting on corrugated iron roofs has made its appearance in the market. The shank of the nail is round and sufficiently sharp at the points to enter the wood readily, and may be driven home in the usual way. The head flattens under the blows of the hammer, or a punch may be used which will give it a conical head. The lead of the head comes in contact with the sheet iron in such a way as to lessen the chance of leaking.

C. S. Griffin writes as follows to the Belfast (Ireland) *Journal*: "I have recently learned a fact that may, if generally known, lead to the tempering of copper. A man at work on the telegraph wires had hold of a copper wire with nippers on one line trying to make a short circuit, when the handle of his nippers touched the copper wire, and instantly a piece of his nippers was melted off and a piece of copper had formed on the point of the nippers, and on trying to file off this copper he found it was tempered to such a hardness that the file would not cut it. My brother, S. C. Griffin, tried to file it to make sure it was really tempered. The ancients knew how to temper copper, but no modern genius has been able to temper it."

BEAUTY AS A MEANS OF HEALTH.

As plumbers have wives, sweethearts, sisters, cousins and aunts whom they love to see beautiful, the following article from the *Medical Record* may fill a desirable office in the family circle:

Before one of the New York working girls' clubs, Dr. Louise Fiske Bryson recently gave an address upon this subject, reversing in more ways than one the usual order of copybook aphorism. While acknowledging the impossibility of any protracted happiness without virtue, and the maintenance of beauty's fine edge with our goodness, the doctor affirmed that systematic efforts to be beautiful will insure a fair degree of health, and that happiness is the best safeguard against vice. The difference in appearrance between one woman and another, it was stated, is more than anything else an affair of style—that beauty of beauties so hard to define and so easy to recognize, which makes the girl of no-colored hair, features of indifferent turn, and lines none too perfect, infinitely more attractive than other maids of faultless curves and innumerable strong points not cemented by this magic quality. Style may be defined, for want of something better to express it, as an attractive manner of holding the body, a firm, graceful way of doing things and moving about. It is the visible sign of inherent power and reserve force. It is the outcome of long, deep breaths and the use of many muscles. The prayer of the New York child, "Lord, make us very stylish," when viewed aright, is recognized as an aspiration based upon sound scientific principles and worthy of universal commendation.

Proper breathing is the first art to cultivate in the pursuit of beauty. The lungs have their own muscular power, and this should be exercised. The chest must be enlarged by full, deep breathing, and not by muscular action from without. Inflate the lungs upward and outward, as if the inflation were about to lift the body off the ground. Hold the shoulders on a line with the hips, and stand so that the hips, chin, chest, and toes come upon one line, the feet being turned out at an angle of sixty degrees. It is wrong to make the bony structure do most of the work in keeping the body upright. The muscles should hold it in position. In walking, keep face and chest well over the advanced foot, and cultivate a free, firm, easy gait, without hard or jarring movements. It is impossible to stand or breathe aright if the feet are pinched. When correct posture and breathing are interferred with, the circulation is impeded, and deleterious substances in the blood tend to make the complexion bad. This is one of the many evils of tight shoes. To be well shod has a marked influence on style. The feet symbolize the body in their way as much as the hands. A clever shoemaker says that in a well-fitting shoe the human foot feels like a duck's foot in the mud. It is held firmly in place, but nowhere compressed. Nothing can exceed the vulgarity and hygienic wickedness of a shoe that is manifestly too tight. For misery-producing power, hygienically as well as spiritually speaking, perhaps tight boots are without a rival. Next to the search for style pure and simple as a means of health, the care of the complexion and the cultivation of the ntght kind of expression are of great importance. The first is largely a matter of bathing and the general hygiene of the skin, while the second—a good expression—is best secured by the constant preference of higher thoughts over lower ones. This is the essence of intellectual living, and is fortunately within reach of us all.

Beauty that is lasting and really worth while is more or less dependent upon a good circulation; while a good circulation is made possible by correct pose, proper breathing, and the judicious care of the skin, something else is also necessary to insure the normal quality and activity of the blood. And this something consists in a combination of sunshine and exercise in the open air. Town dwellers have too little of these blessings, partly from circumstances and partly from lack of wit. Exercise is the most

important natural tonic of the body. Without it there can be no large, compact, muscular frame. It is as essential to physical development as air is to life, and imperative necessity in the maintenance of beauty. To keep the complexion and spirits good, to preserve grace, strength, and ability of motion, there is no gymnasium so valuable as the daily round of house work, no exercises more beneficent in their results than sweeping, dusting, making beds, washing dishes, and the polishing of brass and silver. One year of such muscular effort within doors, together with regular exercise in the open air, will do more for a woman's complexion than all the lotions and pomades that ever were invented. Perhaps the reason why that housework does so much more for women than games is the fact that exercise which is immediately productive cheers the spirit. It gives women the courage to go on with living, and makes things seem really worth while.

In a general way the great secrets of beauty, and therefore of health, may be summed up as follows: Moderation in eating and drinking; short hours of labor and study; regularity in exercise, relaxation and rest; cleanliness, equanimity of temper, and equality of temperature. To be as good looking as possible, and to be physically well, one must in general be happy. And to be happy, it is necessary to carry out ideas of personal taste and preference, as many of them as can be put into definite form without infringing upon the rights of others. Happiness has a distinct æsthetic and hygienic value. In itself it will secure perfect poise and respiration. To be happy is a duty just as style is a duty, and both are in great measure an affair of intellect and management. The old order put the cart before the horse; it said: "Be virtuous and you will be happy," a rule with many exceptions. But the old order changeth. And the modern gospel postulates happiness and material prosperity as the basis of morality. Other times, other manners. The ardent pursuit of good looks sums up the best there is in hygiene, and becomes a legitimate and praiseworthy means of health. The world has yet room for two or three truths, of which not the least is the fact that the definite desire for personal beauty—which was in the beginning, is now, and ever shall be—constitutes in itself a perfectly proper and meritorious inspiration to effort, especially in a country where the shades of Puritanism linger as a sad inheritance, and where disinterred Buddhism claims too often the frail neurasthenic for its own.

SOME PROBLEMS OF LARGE BUILDINGS.

In the construction of large buildings, size alone produces numberless problems that are never met in structures of ordinary dimensions. In the great Cathedral on Fifth Avenue, New York, the stone gutters, one of which is about 200 feet long, presented unusual difficulites. The gutter itself is cut in a stone two feet wide and of convenient lengths. These stones, which rest on a wall, were laid in paint skins and were driven tightly together. It was found, however, that in cold weather hair cracks made their appearance in the joints. It became necessary to line the stone gutter with copper, which was carried up under the slate and let into the joint of the parapet which is on the outer edge of the gutter. The parapet is seven feet or more high, and of course inside of it there is a fine place for drifting snow. To prevent frost and ice from obstructing or destroying both gutter and roof, a steam pipe is placed seven inches above the bottom of the gutter itself, and connected with the boilers of the building. At frequent intervals along the wall spillways are cut in the stone under the parapet. These spillways are intended for relief of the gutter in case the leaders or gutters themselves become obstructed. On a roof at such an elevation, with no neighboring buildings of a similar height, it would seem that obstructions would be rare if not impossible. But though the 8-inch leaders are really more than ample to carry away even phenominal storms, it has frequently been found that not a drop would come down the leader, while the water was pouring from the spillways. Investigation showed that a stick or a small piece of wood had been blown across the mouth of a leader, and over this a piece of paper has been as neatly placed as though by human hand. With the shifting dust the whole was perfectly water-tight. Such things have occurred so frequently as to be no longer regarded with wonder. Although the steam pipes usually give the most ample protection against frost in the gutters, yet on one occasion at least they were only partially able to do the work. After a heavy storm the gutters were found full of snow to the top of the parapet. Steam was turned on and the pipes were kept hot for a considerable time. When the superintendent went up to examine the condition, he disappeared in a snow arch which was over six feet in the clear. The pipes were doing their best, but at such a distance their radiation was small, and their work was of necessity slow.

Another difficulty encountered in all large and lofty buildings is the upward rain which always accompanies a rain storm during a high wind. The wind, striking against the large area presented by the side of the building, is diverted in all directions, and a large part goes upward with great violence, taking the rain with it like an inverted cataract. The joints of the masonary under the cornices and other projections are subjected to a searching blast, as from a hose pipe. Rain under such circumstances gives the construction a more severe test than it ever receives in an ordinary down pour, the force of the wind being much greater than that of gravity. The water under such conditions is driven into every opening or crevice by the violence of the wind, and rushes up past the eves and cornices with a fury which is not easily imagined by one who has not experienced its power. In fact, during a hard shower, accompanied by a gale, one may stand on the corner of the Cathedral on the windward side and yet not be able to feel any rain. The falling drops are all taken upward by the wind. Looking over the edge a furious deluge will be found rushing upward.

To prevent this storm driven water from getting into the building, the most careful and painstaking workmanship was bestowed upon the joints under projecting members, whether large or small. Mason work which would have been pronounced absolutely perfect on any ordinary building was found hardly good enough to resist such a test. Practically all the joints had to be gone over in the most painstaking manner in order to make them water tight under the combined action of the wind and rain. —"P" in *The Mechanical News.*

PLUMBING NOTES.

The plumbers of Columbus, O., who have been attached to the Federation of Labor, have reorganized into the United Association of Plumbers, Steam and Gas Fitters and Fitters Helpers as Local Union No. 57. At the meeting May 1, the following officers were elected: President, Louis Bauman; Vice-president, Charles Zengler; Past President, Mack Snively; Recording Secretary, Edward P. Beck; Financial Secretary, William Lang; Treasurer, George Taylor; Inside Sentinel, Fred Trautman; Outside Sentinel, John Brow; Directors, Fdwin Wolf, John Harris and Hugh Hannon.

A Brooklyn Plumbers and Gasfitters' Union has over 700 members.

M. J. Kane, plumber, of San Francisco, formerly at 238 Sixth street, has removed to 307 Sixth.

The following is told on J. L. Mott, well known among the plumbers of the country who can enjoy a good thing when it comes their way: Mr. Mott and a friend were seated at Delmonico's one night when the friend said: "Oh, I should so much like to order a beefsteak and onions, but I'm afraid to as I am going to call on some young ladies by and by." "Never mind," said Mr. Mott, "go ahead and order the onions. When you get Delmonico's bill it'll take your breath away."

It is probable that the differences of the plumbers, in Providence, R. I., will be settled at an early date. The strikers have sent a communication to the Master Plumbers' Association, asking that a committee of five be appointed to confer with five of their number, and if possible, effect a compromise on the points in dispute. In compliance with this request the association has chosen J. F. Johnson, Alexander O. Cook, William Kennedy and Alfred Clarkson to meet the men and talk matters over.

The microbe chinned the plumber some,
The plumber chinned him too:
"Why do you come 'round here to plumb?"
"To set a trap for you."

The journeymen plumbers of Pittsburgh and Allegheny struck against new rules promulgated last week by the masters. About 350 men are out. There is no material change in the strike of the carpenters and stonemasons. About one third of the men are reported at work.

The mannfacturing potters have announced the end of the lock-out which has existed at the seven sanitary ware potteries of Trenton, N. J., for twenty-one weeks. When one of the prominent manufacturers was asked how they arranged the terms he said it was a case of give and take. The details are complicated and could not be stated briefly. The men have commenced work.

The old man sat in his easy chair
Smoking his pipe of clay;
For well he knew the plumbers had kept
The microbes all away.

The *Contractor and Builder* says: The National Association of Master Plumbers will hold their next convention in Cincinnati in June. The stir has commenced already of delegates; St. Louis will as usual be represented by men of quiet and orderly demeanor and bearing, intelligent, and at the same time determined to accomplish and gain due recognition which our city is entitled to in the way of National officers for the ensuing year.

The *Sanitary Plumber* says: The proper representation of the plumbing trade at the Chicago World's Fair is a subject that should engage the thoughtful attention of the trade to insure its proper presentation at the next convention of the National Association. There should be an exhibit showing the advancement made in sanitary science, apart from any display of appliances made for advertising purposes, and the former should be made under the direction of a committee of the most competent and intelligent master plumbers in the country.

The bacilli came down like a wolf on the fold,
And strove to enter a human household;
But the plumber was there with his art of renown,
And the bacilli swept out when the flush rushed down.

In regard to the bills presented before the Rhode Island Legislature with reference to plumbing inspection, the Pawtucket *Times* says: "Among the bills presented in the State Senate yesterday in which Pawtucket people have a special interest was that authorizing the city council to appoint an inspector of plumbing. There is no doubt that such an officer is needed, and the bill simply carries out the recommendations recently made by the Sewer Commissioners. That recommendation was made because the commission had found that the drainage of many of the houses here is imperfect, and the plumbing not of a kind to insure a good sanitary condition of the dwellings. The commissioners have not the power to correct the evils they have found and a new law is absolutely needed. Reports from the State Board of Health show the prevalence of diseases such as scarlet and typhoid fever and diphtheria, and there are citizens who believe that many of these can be traced to defective plumbing and bad drainage. The public health should be carefully guarded, and in no better way can it be done than by the appointment of a competent man as inspector of plumbing."

Charles Edgar, of Lexington, Ky., is another one who thinks The Sanitary News "a valuable paper for the plumber," and forwards his subscription.

Mr. Cauldwell Frazer, a prominent member of the New York Association, and who was elected a delegate to the Cincinnati convention, sailed the 13th for Europe, and the length of his trip abroad will prevent him acting as delegate.

Maid of Athens ere we part
Let me whisper to thy heart:
Never marry a man who'll roam
Around for a tinker to plumb your home.

The Texas Master Plumbers' Association met at San Antonio the 13th inst. Delegates to the annual convention were elected. Of the Texas Association the *Commerce and Building Record* says: This organization is growing rapidly and exhibits a flourishing condition, and, like all other associations of men, interested alike in the same business pursuits, when properly organized and conducted with an object for the common good of all, will be productive of great benefit to its members individually and collectively.

At an early hour last Saturday morning the manufacturing potters who had been in session since 9 o'clock the night before, announced the end of the lockout, which has existed at the seven sanitary-ware potteries of Trenton, N. J., for twenty-one weeks. The beginning of the end was reached when a committee representing the operatives and a committee representing the General Potters' Association reached an understanding. The operatives were represented by Michael Kennedy, of the Equitable Pottery; John Kelly, of Maddock, and William Mushett, of Delaware. The Manufacturers' Association was represented by a committee consisting of James Moses, of the Mercer Pottery; John A. Campbell, of the International, and John Moses, of the Glasgow. This committee came into existence by a resolution recently offered at a meeting of the Potters' Association to consider both sides of the question and to arrive at some conclusion. Friday night they bore to the sanitary-ware manufacturers, who were then in session, their conclusion. They presented their conclusions at 11:30 P. M., and they were promptly accepted. When one of the prominent manufacturers was asked how they had arranged the terms he said it was a case of give and take. The details are intricate and could not be briefly stated. It is enough to know that the strike is ended and that the potters will begin work on Monday next. The trouble arose over the attempted reduction in the potters' wages, and was continued when the manufacturers tried to effect a settlement by ignoring the Knights of Labor organization, with which the potters are affiliated. Nearly 1,000 hands were affected, but many of these have left the city to seek elsewhere for work.

A plumber once was asked to bid
Upon a plumbing job;
But when the builder saw the sum
He thought he meant to rob.
He straightway then a tinner got
Whose pipes were all of tin;
And now his house is four by eight
And has no plumbing in.

FOR THE DIGESTION.

Daughter—Father, Mr. Hendricks is a very bright young man. Father—He must be. I notice that you never have a light in the parlor the nights he calls—*Brooklyn Life.*

"I don't believe any young man that stays as late as young Jinkins does has his full share of sense," remarked Blogson to his daughter. "Oh, yes, he has pa," was the reply. "His father is a stockholder in the gas company."—*Washington Post.*

There are a good many men in the pulpit who would not be there if they had not misunderstood the Lord.—*Ram's Horn.*

Customer—"Are you sure this bread is fresh, baker?" Fresh baker—"Well, I should say so—it's to-morrows."—*The Talisman.*

It is explained that one reason why more women do not get into the habit of smoking cigars is because they begin smoking cigars that they buy themselves.—*New York Recorder.*

Yabsley—"The butcher that sold this meat for lamb must have had a pretty accommodating conscience." Mudge—"Perhaps the sheep was in its second childhood."—*Indianapolis Journal.*

Teacher—"Tommy, can you give me a sentence in which but is a conjunction?" Tommy—"See the goat butt the boy. Butt is a conjunction, and connects the boy with the goat."—*Brooklyn Eagle.*

Brown—"Why in time do the papers make so much over Bixby's household infelicities? It's nobody's business, anyhow." Fogg—"My dear boy, it is because it is nobody's business that everybody is interested in it."—*Boston Transcript.*

Bunko Pete—"Well, d'ye go down an' do up Farmer Hasede?" Slippery Jim—"Yas, I dun him out o' three hundr'd, but that wa'nt no good!" Bunko Pete—"Why not?" Slippery Jim—"I was just blank fool enough to trade horses with him before I left."—*Brooklyn Life.*

"You mustn't associate with chickens," said Mother Duck to her ducklings. "Why not, mamma?" "Because they are not in the swim."—*Brooklyn Life.*

Possibly all of this grip that we hear so much of was engendered by the accumulating mulitudes of secret societies

that are now infesting the land. Each one is said to invent a new grip, and this prevalent malady may be the aggravated result.—*Des Moines Leader.*

"But is he brave—has he personal courage?" "Well, I should say so. He wouldn't be afraid to umpire a game of ball between amateur nines."—*Philadelphia Times.*

"Waiter, take this soup back to the kitchen." "Might I ask why?" "Of course. While you recommended it warmly you have served it cold."—*Fliegende Blatter.*

"Is Brown a good poker player?" "Is he! Last summer he introduced his office boy as his employer to his landlord and got three months' credit."—*New York Recorder.*

Papa—"Well, Jack, what book have you found most valuable this year?" Jack (thoughtfully)—"To tell you the truth, father, I lost on every book I made."—*Munsey's Weekly.*

"The ethics of your profession do not permit you to advertise?" "No," sadly answered the hungry young physician, "not even in the want column."—*Indianapolis Journal.*

Wife (looking over the paper)—"Here is a long obituary notice of some man I never heard of. I wonder what he was." Husband —"The editor of the paper, probably."—*New York Weekly.*

A lady in Bangor, Me., who has been a paralytic since 1879 has been restored to health by riding in an electric car. On several late night cars in this city partially paralyzed citizens have been seen riding, but it was never supposed they were out riding for their health.—*St. Paul Pioneer Press.*

TRADE AND BUSINESS NOTES.

The Syphon Closet Company of Trenton, N. J., and New York city, have issued a neat illustrated catalogue clearly setting forth the merits and claims of their syphon closets. They manufacture their sanitary specialities from the clay to the complete finished appliance, and through their catalogue are able to exhibit a fine display. In speaking in the support of the syphon closet, the manufacturers say: "The syphon closet marks a more positive and decided advance towards perfect sanitary cleanliness and health than anything that has yet appeared in their line. This is apparent from the exceedingly simple and natural working of its parts—its freedom from springs and unreliable valves; no openings likely to be choked, or become impure; absence of imperfect overflow devices and insecure traps that collect filth; and, in fact, the complete and perfect working of all its parts, in compliance with natural laws and the best sanitary ideas of the age, must ensure their quick adoption by all who value health and cleanly comfort as indispensable requisites of domestic economy." Catalogues and particulars will be sent on application. See advertisement in this issue.

We are in receipt of catalogues from the Backus Water Motor Company, of Newark, N. J., presenting to the trade their water motors and ventilating fans. The catalogues are neat, illustrated and present in detail the manufactures exhibited. Small motors are coming into such general use, and are so convenient about buildings and homes that information regarding them is interesting. The same is true of rotating and exhaust ventilating fans. The most complete we have seen is the Backus. Information will be sent to anyone writing the above firm.

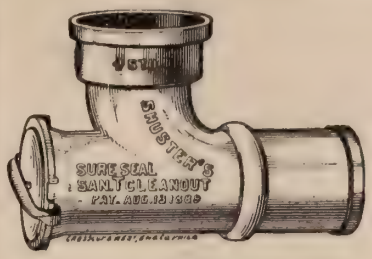
We have a catalogue from the Detroit Heating and Lighting Co. of 175 Wight street, Detroit, Mich., which presents the merits of the well known Bolton Hot Water Heater, which is handled in Chicago by Baker & Smith Co., of 81 and 83 Jackson street. The catalogue is a handsome one, neatly printed and illustrated with wood engravings, pen sketches, half tone and photogravure. In connection with the heater radiators are presented arranged for both direct and indirect heating. Extracts of letters are given containing strong endorsements showing the popularity of the Bolton heater. The advertisement of this heater will be found on first page of cover in this issue.

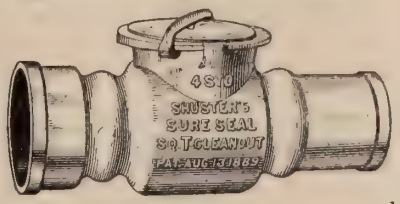
A Pennsylvania jurist has decided that piano-playing is manual labor.

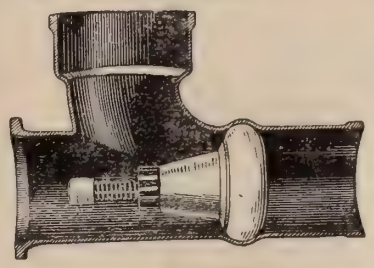
Exports from northern Germany to the United States decreased $2,439,865 in the first quarter of 1891.

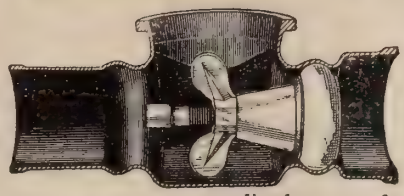
SHUSTER'S SURE SEAL CLEANOUTS.

L. Shuster, Jr., of 402 Franklin street, Philadelphia, presents below a new and useful improvement in the way of a cleanout for soil, waste, or drain pipe. It is designed to overcome the difficulty heretofore experienced by plumbers when inserting a test plug on the inside of a cleanout, for the purpose of applying a test either of fluid or air, and to avoid the risk of having the test plug driven by the pressure to an inaccessible point in the drain, thereby necessitating the removal of a portion thereof to withdraw the test plug. To all who have had such experience, the sure seal cleanout will be appreciated.









The improvement consists of a pipe having an expansion or swell formed in it, contiguous to an opening or hand hole, affording roomy access to the interior for cleaning, and for the introduction of an expansible stopper for closing the pipe, so as to subject it to fluid or air pressure. The hand hole is sealed with a plate with a tapered projecting rim, which fits into a correspondingly tapered mouth, with a rubber collar between the two surfaces; the plate is held securely in its place by a malleable iron yoke, doing away with any screws, and which can be removed and be replaced with a hammer, by simply driving the yoke the way desired.

The yoke has a projection in the center, which fits into a recess in the center of plate; the ends are returned and catch on the under side of the inclined surface of the rim of the hand hole.

The accompanying cuts will illustrate better than words can express the merits of the appliance, and that a test plug properly inserted is there to stay.

Mr. Shuster will be pleased to forward to the president of any Master Plumbers Association, for exhibition purposes, a pair of his cleanouts, with a Clark plug and a pair of wrenches, on application.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Bauer & Hill have completed plans for the new House of Providence, to be erected at the corner of Elm and North Market streets. It will be 4-stories, 90x150; cost, $50,000. They have alsoplanned a north wing to St. Elizabeth's Hospital at the corner of Davis and Thompson streets. It will be 4-stories, 180x60, of pressed brick and stone. A portion of the building will be used as a convent for the Poor Handmaids of Jesus Christ, and the rest for a hospital; cost, $60,000. D. A. LaPointe has designed a 4-story and basement apartment house, 121x51½, for Geo. C. Fetler, to be erected at the corner of Berkeley avenue and Forty-second street; cost, $30,000. He has a 3-story residence, 38x70, for W. E. Mason, to be built on Washington boulevard, east of Homan avenue; cost, $15,000. He has also designed for H. B. Owsley a 4-story and basement residence, to be built on Astor street, near Burton place. Stone construction; cost, $15,000. Also for C. W. Cole, at Winnetka, a 2-story summer residence; cost, $5,000.

Thomas Hawkes is engaged on plans for a 10-story apartment house, 120x131, to be erected at the northeast corner of Dearborn avenue and Division street by Dr. R. V. Price; cost, $500,000. Thomas W. Wing has designed three dwellings, 50x89, for Mrs. Mary E. Page, to be erected on Prairie avenue, near Twenty-fourth street; cost, $25,000. He has also planned a 4-story apartment house, 45x64, for Mrs. Wm. J. Knight, to be erected at State and Forty-fourth streets; cost, $25,000. Lamson & Newman have designed a 4-story store and flat building, 40x90, to be built at 212-14 West Madison street by Geling & Plautz; cost, $25,000. Arthur G. Morey has planned a 3-story and basement flat building, 23x60, to be built at 567 Seminary avenue by Robert Griffith; cost, $6,000. E. R. Krause has designed a 4-story flat building, 40x100, for Henry Schoellskopf, to be built on North Clark street, near Chicago avenue; cost, $20,000. J. M. Van Osdel has designed a 4-story apartment house, 50x80, for Mrs. Bertha Marsh, to be erected on South Park avenue, near Thirtieth street; cost, $30,000. They are also remodeling David Pyatt's residence on West Jackson street; cost, $6,000. O. W. Marble has designed five 3-story and basement dwellings, 100x73, to be erected at Ellis avenue and Forty-sixth street by W. H. Pruyer; cost, $75,000. Adler & Sullivan have completed plans for the new German Theater and Club-house, which is to be erected on Randolph street, between Clark and Dearborn streets, by the German Opera House Association. The building will be 16-story, 80x181, and will be constructed of steel, tile and terra cotta. The plans for the building devoted to mines for the World's Fair are complete, and bids for its erection are invited. The plans were prepared by Architect S. S. Beman, and the building will cost $350,000. J. E. O. Pridmore has designed a 3-story store and hotel building, 26x72, for H. D. Hollister, to be erected at 4313 Cottage Grove avenue; cost, $11,000. He has also planned the reconstruction of a residence for Mrs. Ward at Evanston. C. M. Palmer is designing a block of 4-story residences, to be erected on the Lake Shore drive by Potter Palmer. ——Philadelphia, Pa.; A new edifice may be built at an early date by the congregation of the Centenary Methodist Episcopal Church, Camden. The Y. M. C. A. Building at Mount Holly, N. J., will be enlarged. Many improvements will be made to the Calvary Episcopal Church, Germantown. A handsome row of thirteen brick houses, 3-story in height, with facings and steps of stone, will be erected by Hunter & Nock, on the north side of Columbia ave. east of Thirty-second street. Firth & Foster are going to erect a 3-story brick factory building, 113x54, on the southside of Taylor street west of Emerald street. The edifice of the Corinthian Avenue German Church, on Corinthian avenue south of Poplar street, will be rebuilt during the summer at a cost of $13,000. The front of the structure will be of Avondale stone with brownstone trimmings. Extensive alterations will be made to the Universalist Church of the Restoration, at Sixteenth and Master streets, from plans prepared by Architects Hazlehurst & Huckel, of No. 410 Walnut street. The plans for the alterations to be made to Musical Fund Hall have been completed by Architect Addison Hutton, who has also prepared plans for an additional wing to be built to the Pennsylvania Hospital. The plans for Mayor Stuart's new house are being prepared by John T. Windrim. A 5-story factory building, 44x83, will be built on the north side of Lehigh avenue east of Filmore street, by George W. Stewart, the contractor. Addison Hutton has plans for extensive alterations to be made to Engle's Hotel, at Beach Haven, N. J. A public hall will be built at Conshohocken after plans prepared by P. Lonsdale. On Eleventh street, north of Master, a new school building will be erected by the congregation of St. Malachi's Church. Architect T. Roney Williamson will soon invite estimates upon plans prepared for a large hall, to be erected at West Chester. Extensive alterations and improvements will be made to the West Jersey Hotel, Camden, during the summer. ——Little Rock, Ark.: Rickon & Thompson, architects, have prepared plans for additions for the Deaf Mute Institute; cost, $10,000. Power house for the City Electric Street Railway; cost, $35,000. Residence for F. M. Fletcher; cost, $3,000. Residence for Geo. W. Martin; cost, $4,500.——Tampa, Fla.: W. H. Kendrick has the contract to erect the court house here. It will be 50x200, 2-story high, built of common, pressed and ornamental brick, granite and marble; cost, $80,000.——Brunswick, Ga.: Architect D. A. Garber has plans for a hall, store and office building to be erected corner Glouster and Rennold streets for Oglethorpe Lodge 45, K. of P. To be 30x90, 3-story, built of brick, marble and terra cotta; cost, $20,000.——Henderson, Ky.: Architect F. J. Schlotter, Evansville, Ind., has plans for a residence to be erected corner Washington and Adams streets, for R. H. Cunningham. To be 41x61, 2-story high; cost, $7,000.——Portland, Ore.: Messrs. McCaw & Martin will soon ask for bids for the erection of Dr. K. A. J. Mackenzie's store house. C. Carmichael has a contract to build four houses for A. B. Steinback, to cost $5,000 each. The contract for the foundation of I. Goodenough's 6-story block has been let to Vincent McCullough. Contractors are figuring on the excavation for F. Dekum's 8-story stone and brick building at Third and W streets. Mr. Blaise Labbe has had plans prepared by Jules Godart for a residence in the French renaissance style, which he is to build at once, on Portland Heights. J. Robertson is building three houses on Ella street for Captain James A. Brown, to cost about $7,000.——Spartanburg, S. C.: T. B. Thackston will erect a business building.——Sumter, S. C.: The Baptists (Rev. C. C. Brown, pastor), will erect a church. To be 60x80, 2-story, built of pressed brick, frame and terra cotta; cost, $10,000.——Forth Worth, Tex.: Architect Sanguinnet has prepared plans for a residence for Hyde Jennings. To be 60x80, 2-story, built of brick and stone; cost, $20,000.——Basic City, Va.: J. C. Jones will erect two brick, granite and marble residences for himself at West Waynesborough.——Graham, Va.: W. E. Bain will erect a 3-story brick building to be used for a hotel and stores. To be 57x60; cost, $10,000.——Clifton Forge, Va.: Mr. V. T. Bagby, of Staunton will build a new hotel to cost $10,000.——Richmond, Va.: Architect B. J. Black has plans for a store building to be erected on Broad street, between First and Foushee streets, for I. D. Cardozo. To be 26x130, and cost $10,000. Messrs. Trexler and Elmore, the contractors, will build three residences on Laurel street, between Main and Carey streets. Each to be 20x75, 3-story; cost, $5,500 each. Architects Rogers & Higham and Chas. H. Read, Jr., have been awarded the premium and are preparing plans for the Chamber of Commerce Building to be erected corner Main and Ninth streets. To be 100x90, 5-story, of common and pressed brick with stone trimmings and granite columns; cost, $100,000. Architect Albert L. West has plans for a warehouse to be erected on Ninth street, between Main and Carey streets, for G. and A. Bargamin. To be 56.10x80, 4-story, of common brick with stone foundations; cost, $12,000.——Collingwood, Ont.: Fred. T. Hodgson, architect, is preparing plans and specifications for the following work; a block of stores on Hurnstani street, for E. R. Carpenter, wholesale druggist; estimated cost, $10,000. A brick and stone residence on the corner of Third and Oak streets, for Mr. F. Telfu, Mayor of Collingwood; to cost about $12,000. A bank building, with offices in upper stories, in Clarksburgh; estimated cost, $5,000.——Brooklyn, N. Y.: Liberty avenue, corner Miller avenue, two 2 and 3 story brick buildings to be used as police station, patrol stable and cells building, tin roofs; cost, $48,250; owner, City of Brooklyn; architect, George Ingram. 102 Henry street, 3-story brick bottle cleaning establishment and dwelling, tin roofs; cost, $3,050; owner, Wm. Littmann, 670 Greenwich street; architect, J. W. Bailey, 66 Court street.

HEATING AND LIGHTING.

New electric light plants or extensions are reported as probable in the following places: Pomona, Cal; Eureka Springs, Ark., address Dr. C. F. Ellis; Key West, Fla., address Russell & Harvey; Westlake, La., address A. J. Perkins; Graniteville, S. C., address the Cotton Shoals Electric Light & Power Co.; Grovania, Ga., address the Grovania Oil & Fertilizer Co.; Macon, Ga., address A. M. Rodgers; Round Bay, Md., address J. H. Irvin, of Baltimore; Yreka, Cal.; Prescott, Ark.:——The following electric light companies have been incorporated: The Peninsular Electric Light & Power Co., Newport News, Va.; capital stock, $40,000; W. W. Archibald, Secretary. Consolidated Electric Co., Birmingham, Ala.; capital stock, $500,000. Harvey Electric, Water & Gas Co., Harvey, Ill.; capital stock, $100,000; incorporators, H. Badger, C. D. Starwood, W. G. Wanzer. People's Electric Light, Heat, Power & Street R. R. Co., Chicago, Ill., capital stock, $80,000; incorporators, C. L. Sackett, J. T. Ranney, G. K. Jones, Watseka, Ill., Electric Light Co.; capital stock,

$8,000. Dundee, Ill., Electric Light Co.; capital stock, $10,000. Metropolis, Ill.: An electric lights ystem is proposed.——Butler, Mo.: The Butler Water, Light and Power Company has been here incorporated, with a capital stock of $100,000.——Wheeling, W. Va.: The Electric Light Commission appointed by the City Council has recommended the purchase of a plant at a cost not exceeding $100,000.——Georgetown, Tex.: There is considerable talk of establishing an electric light plant at this place.——Ft. Madison, Ia.: Extensive improvements are to be made to the local gas lighting plant.——Centralia, Wash.: Charles B. Hurley, of the Northern Improvement Company, has purchased the local electric light works. A new engine, of 140 horse-power will be added to the plant.——San Jose, Cal.: The Light and Power Company, of this place, has decided to issue bonds to the amount of $60,000 to improve the works, and enlarge the capacity of gas production and electric light power.

SEWERAGE NOTES.

Bangor, Me.: A considerable amount of sewer work is projected. West Haven, Conn.: Surveys for surface drainage are being made.——Rochester, N. Y.: An act has been passed providing for the construction of a sewer in the 9th and 15th wards, and in the towns of Gates and Chili, Monroe county.——Sandy Hill, N. Y.: A sewerage system is contemplated.——Port Jervis, N. Y.: The sewer commissioners have engaged Mr. Wm. B. Landreth, of Schenectady, to prepare plans for a system of sewerage.——Passaic, N. J.: The City Council intends to lay that part of the Waring system of sewers, having its outlet into the Passaic River. It will be of vitrified pipe, with 10 in. iron pipe for the outlet.——Orange, N. J.: The Common Council has approved the contract with Mr. C. P. Bassett to superintend all the sewerage contracts.——Landsdown, Pa.: An engineer has been investigating the question of sewerage, and estimates the cost at about $20,000 to $35,000. A large sewer would be built to Darby Creek.——Germantown, Pa.; A branch sewer is to be built to drain the west side.——Philadelphia, Penn.: It is proposed to spend $400,000 on main sewers, $150,000 for branch sewers at Chestnut Hill and Mt. Airy, $25,000 for Wingohocking sewer, $75,000 for Milk Creek sewer, $50 for Aramingo Canal sewer.——Baltimore, Md.: The council has authorized the expenditure of $11,000 for the Ann and Gay street sewers and $190,000 for Druid Hill sewer. Covington, Ky.: It is proposed to build a sewer in Willow Run at a cost of $125,000.——Ashtabula, Ohio: A sewerage system is to be constructed.——South Bend, Ind.: A trunk sewer is proposed for the First Ward, and Chapin Creek will probably be converted into a sewer.——Jerseyville, Ill.: A gravity system of sewerage is to be established and part of it to be put in operation this year. No surface water will be discharged into the sewers, but they will be flushed by roof water and water from city mains. The sewage will be discharged into ravines outside the city limits, the rainfall being depended upon to wash it down these ravines.——Owatonna, Minn.: A sewerage system is proposed.——Puyallup, Wash.: Plans have been prepared for a system of sewerage, and an election will be taken on the issue of bonds.——Meridian, Miss.: It is proposed to organize a company, with a capital stock of $10,000, to build sewers. For particulars, address the mayor.——Boise City, Idaho: $50,000 will be spent for sewerage improvement.——Middleboro, Mass: The town has voted $25,000 for additional sewerage.——Sanilac Center, Mich.: Address Village Clerk H. A. Babcock in regard to proposed sewage improvements.——Asheville, N. C.: The people have voted to expend the sum of $100,000 on improving the sewerage system.——Augusta, Me.: The question of establishing a complete sewerage system at this place is at present being discussed by the local officials. Particulars can be obtained by addressing Prof. R. B. Capen, City Engineer, as above.——Roseburg, Ore.: Address the mayor in regard to contemplated sewerage improvements.——New Whatcom, Wash.: The City Council is discussing the question of bonding the city in the sum of $25,000 for sewerage purposes. Mayor Jenkins can furnish particulars.

WATER WORKS NOTES.

Freeport, Me.: Works are projected. It is proposed to pump from a stand-pipe.——Goffstown, N. H.: S. D. Upton or J. H. Connor can furnish information regarding proposed works.——Providence, R. I.: The Senate has passed in concurrence an act authorizing the city to issue $500,000 water extension bonds.——Batavia, N. Y.: A water supply system is proposed.——Huntington, N. Y.: A franchise has been granted to the Huntington Water Works Co. for works within the Union School District. Water will be pumped from wells to a 250,000 gallon reservoir or stand-pipe with its high water line 120 feet above the main street. There will be about 4½ miles of mains and 35 hydrants. James M. Brush is President, and Joseph Irwin, Secretary of the company. G. R. Rogers is Town Clerk.——Rochester, N. Y.: It is reported that $50,000 will be asked for water main extensions this year.——Warwick, N. Y.: Bonds to the amount of $15,000 were recently voted for a new reservoir.——Yorkshire Centre, N. Y.: The Yorkshire Water Co. has been organized. G. N. Cowan, Stamford, is interested.——Maple Shade, N. J.: The Maple Shade Land Co. contemplate erecting works.——Ocean City, N. J.: It is reported that works are to be built.——Somerville, N. J.: A 1,000,000 gallon steam pumping engine is to be added. W. H. Taylor is secretary of the company.——Latrobe, Pa.: Arrangements are being made to build a new reservoir and pump house and lay about 2½ miles of 16-inch mains. W. A. Johnston is superintendent.——Washington, Pa.: The water company of which J. Mac Jones is superintendent proposes to build another dam and reservoir and put in a new filter.——Milford, Del.: Nathan Pratt, President, can furnish information concerning the water works system to be built.——Parkersburg, W. Va.: The Spring Brook Water Co. is being formed to supply Elberon and Riverside, places with a population of 2,000. The supply will be from springs one mile distant, and the works are estimated to cost $20,000. Address Z. F. Taylor.——Carrollton, Ga.: A franchise for works has been granted.——Rome, Ga.: The water supply will be increased.——Sheffield, Ala.: The water company will issue bonds to increase the works. Address J. V. Allen, Secretary.——Union City, Tenn.: The city has issued bonds for the erection of works. An engineer may be engaged by the city.——Dayton, Ohio.: The State Legislature has passed a bill authorizing $50,000 of bonds to extend water mains.——Bridgeport, Ohio: The Martins Ferry system will furnish a supply of water to Bridgeport.——Put-in-Bay, Ohio: The Put-in-Bay Water Works, Light & Railway Co. have been incorporated by Toledo capitalists; capital, $150,000.——Delphi, Ind.: The Delphi Water Works Co. has been incorporated; capital, $5,000.——Fowlerville, Mich.: An act authorizing bonds for works has passed the house.——Sparta, Mich.: The Sparta Water Co. has been organized by L. W. Welch, A. B. Cheney and others.——A stand pipe is proposed.——Dundee, Ill.: The Dundee Water Co. has been incorporated; capital, $10,000.——Metropolis, Ill.: The people have voted in favor of water works. The pipe has been purchased. Address F. A. Trousdale.——Burlington, Wis.: $8,000 will be expended in extending the water mains.——West Superior, Wis.: The water company will buy an additional pump with a capacity of 5,000,000 gallons. J. Mather is manager of the company.——Council Bluffs, Ia.: The Greenwood Water Company has been incorporated by D. N. Graves, J. H. Kent and others.——Sioux City, Ia.: Additional mains will be put in.——Luverne, Minn.: Plans have been prepared for works.——Tracy, Minn.: A system of works will be put in in the near future.——Worthington, Minn.: Plans for a system of works have been prepared.——Ponca, Neb.: A system of water works will be built at a cost of $10,000.——Hill City, S. Dak.: A gravity supply of water from Newton's Fork, some miles distant, is under discussion. The plan includes a reservoir. W. H. Mitchell is president of the Board of Trade, and will furnish particulars. Rawlins, Wyo.: The works will be enlarged at a cost of $35,000.——Butler, Mo.: The Butler Water, Light & Power Co. has been incorporated; capital, $100,000.——Kansas City, Mo.: The people have voted $2,000,000 of bonds for works.——Dallas, Tex.: A 10,000,000 gallon pumping engine will be added. Address City Engineer D. A. Rayner before May 20. Galveston, Tex.: A large portion of the $1,240,000 realized from the sale of bonds to be soon issued, will be used for water works improvements.——Spokane Falls, Wash.: The people will vote on the issuance of $500,000 in bonds for water works improvements.——Ruby City, Wash.: The Water, Light & Power Co. has been incorporated with a capital of $100,000.

BIDS AND CONTRACTS.

Lowell, Mass: Bids are wanted for the enlargement of the water-works engine house.——Arkadelphia, Ark.: Bids for a water-works franchise will be received until May 26.——Dallas, Tex.: Bids for a 10,000,000 gallon pumping engine will be received by City Engineer D. A. Rayner until May 20.——Chicago, Ill.: The Grant Locomotive Works, of Chicago, Ill., have invited architects to figure on the design of the buildings. They will include a machine shop, 110x370 feet; erecting shop, 80x285 feet; hammer shop, 80x125 feet; blacksmith shop, 80x250 feet; paint shop, 70x100 feet; boiler shop, 100x250 feet; wood-working shop, 70x230 feet; pattern shop, 60x130 feet; foundry, 89x260 feet; dynamo room, 50x60 feet; core room, 50x60 feet; cupola room, 60x 80 feet; boiler room, 50x70 feet; office and store, 40x130 feet; President, E. T. Jeffrey; capital stock, $800,000.——Galveston, Tex.: Until May 25, 1891, sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., for the labor and materials required for the approaches to the U. S. Custom House, Postoffice, etc. building at Galveston. Address W. J. Edbrooke, supervising architect.——Bristol, R. I.: Supervising Architect W. J. Edbrooke will receive until May 20, sealed proposals for putting in the steam heating apparatus of the U. S. Custom House building.——Knoxville, Tenn.: Sealed proposals are wanted until May 20 for certain alterations and repairs in plumbing, vault work, etc., for the U. S. Court House and Postoffice building. Copies of the drawings and specifications can be had on application to Supervising Architect Edbrooke at Washington.——Port Jervis, N. Y.: Until May 29 sealed proposals will be received for the construction of 15 miles of pipe sewers. Address Francis Marvin, president of the Board of Sewer Commissioners. A certified check for $500 must accompany all bids.——West Point, N. Y.: Sealed proposals, in triplicate, subject to the usual conditions, will be received until 12 o'clock, noon, on Monday, the 8th of June, 1891, for the delivery at West Point, N. Y., of 40 water closets, 40 bath tubs, iron pipe, branches, bends, traps, and miscellaneous articles of plumbers' materials. Full information as to articles and quantities required will be furnished upon application. Inclose proposals in envelope, marked, "Plumbers' Materials," and addressed to W. H. Miller, Captain and A. Q. M., U. S. A. at the office of the Disbursing Officer, U. S. Military Academy, West Point, N. Y.——North Yakima, Wash.: Proposals are wanted until June 15, for the construction of a system of sewers at this place. Address F. M. Spain, city clerk, as above.——Toronto, Can.: Proposals are wanted until May 19, for the construction of numerous sewers at this place. Address John Shaw, chairman Committee on Works, as above.

WHERE PLUMBING WORK IS BEING DONE.

Armour ave. and Twenty-sixth street, Unknown; 3206 Auburn ave., Wm. Cotter & Son; 204 Bissell, G. Weinbach; Carpenter bet. Sixty-third and Sixty-fourth, J. J. Doyle; Clarence ave., north of Grace, W. J. Bleter; 2303 Commercial ave., P. Feltmann; 2610 Calumet ave., R. M. Millar; 799 Cortland, T. W. Page; 221 Ewing, Nash & Hanna; 610 Elston ave., Bayha & Bachman; 336 Forest ave., Garner & Bahn; 3037 Fifth ave., J. Teutsch; Forty-second, A. Miller; 2125 Archer ave., J. H. Killian Co.; 3206 Auburn ave., W. Cotter; 714 Belmont ave., R. H. McCabe; 435 Chestnut, D. F. Dewar & Co.; 199, 201, 203 Colorado ave., C. Jurgenson; 335 Halsted, Nash & Hanna; 1080 Hinman, J. Shannon; Hastings and Lincoln J. Shannon; 112 Hudson ave., Bayha & Bachman; Herndon and Marianna, P. Feltmann; Hamden Court north of Wrightwood ave., Foskett & Brown; Hoyne ave. cor. Thomas, E. Breyer; 3351 Indiana ave., A. A. Campbell; 964 Kimball ave., Nelson & Ceelhoffen; 2801 Lowe ave., M. Weber; 4400 Langley ave., S. Parker; 221 Larrabee, Bayha & Bachman; 6441 McChesney, J. Teutsch; 5333 Monroe, J. J. Rourke; 852 Melrose, J. Bletch; 637 639 Noble, P. Feltmann; Oakdale ave. E. R. R. track, P. Feltmann; 404 Paulina, J. Shannon; Polk cor. Sacramento ave., M. Stack; 3223 Portland ave., E. Himmersdorf; 2939 Poplar ave., John Watson; 470 Robey, Nelson & Ceelhoffen; 611 Racine ave., P. Feltmann; 402 Robey, Nelson & Ceelhoffen; Seventieth and Loomis, J. J. Doyle; Seventy-second and Peoria, J. J. Doyle; 4438 Sidney ave., H. A. Black; 77 Sholto, P. J. Morrisey; 104 Samuel, Glenn; 5313 School, Wm. F. Metz; 3812 Stanton ave, C. Sullivan; Twenty-sixth and Armour, Nash & Hanna; 163 Twenty-first, J. T. Martin; Thirty-first and Ullman, J. Teutsch; Thirteenth and Robey, John Watson; Twenty-fifth Court, John Watson; 946 Thirty-seventh, Geo. Merz; 1012 Union, D. T. Shay; 674 VanBuren, M. McDonald; 859 Washtenaw ave., H. Breyer; 808 Washtenaw ave., Nelson & Ceelhoffen; Wells and Pearson, E. Baggot; Wright and Sixty-seventh, E. Hennessey; 4308 Wabash ave., E. Hennessey; 7014 Wright, E. Hennessey; Ward and Marianna, P. Feltmann; Ward and Diversey, P. Feltmann; 328 Woodside ave., P. Feltmann; 5916 Wentworth ave., Bryson & Son; Western ave. south of North ave., R. C. Millar; 6242 Wentworth ave., D. F. Dewar & Co.; 4549 Wabash ave., F. N. Kuhn; Wallace near Thirty-first, J. J. Quinn; Emerald south of Seventy-ninth, Lyon & Lee; Forty-sixth and Wentworth ave., F. N. Kuhn.

THE MASTER PLUMBERS.

If you are going to attend the meeting of the Master Plumbers in Cincinnati in June don't forget the Old Reliable and justly popular Brighton Route, running the finest trains and being the only line from Chicago that lands passengers in the Grand Central Station, Cincinnati. Reduced rates will be made for the meeting. Address for rates, etc., J. C. Tucker, General Northern Agent, 234 Clark street, Chicago.

ROSE POLYTECHNIC INSTITUTE.

The Rose Polytechnic Institute, an advertisement of which appears in the present issue of the Sanitary News, is one of three or four schools in the U. S. which are especially devoted to the education of Civil and Mechanical Engineers. One of the peculiar features of the Institute is the thorough and extensive "shop practice" of the students in Mechanical Engineering. Not only are machines designed and working drawings made, but actual construction is required and is made possible in extensive workshops, the equipment of which has cost over forty thousand dollars. H. T. Eddy, the new President, is well known as the Dean of the Faculty of the University of Cincinnati, and a great educator and organizer.

EXCURSION RATES TO CINCINNATI VIA BIG FOUR ROUTE ACCOUNT.

NATIONAL UNION CONFERENCE FARMERS' ALLIANCE.

On account of the National Union Conference to be held at Cincinnati May 19th to 21st, excursion tickets will be sold via the Big Four Route May 18th and 19th, good returning until the 22d, at the low rate of one fair for the round trip. The excellent train service of the Big Four Route, together with through coaches, palace sleeping cars, and elegant dining cars make this the popular line to Cincinnati, and all who contemplate attending the Conference should ask for tickets via the Big Four Route. D. B. Martin, General Passenger Agent, Cincinnati, O. Ticket office 234 Clark street, Grand Pacific Hotel Block.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

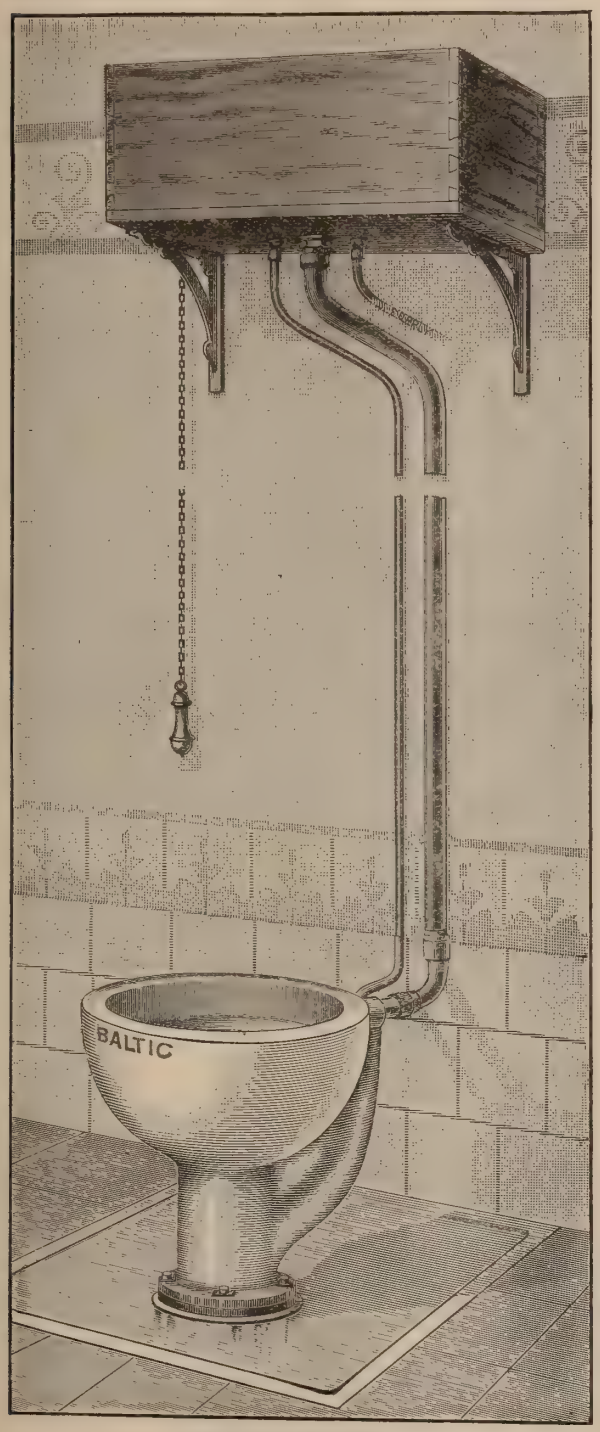
L. WOLFF MANUFACTURING CO.,

FINE SANITARY FIXTURES.

WOLFF'S IMPROVED "SIPHON" CLOSETS.

THE "BALTIC."

ALL PORCELAIN. ROUND TOP. SIPHON CLOSET.



No. 81. Plate 904.

Monarch Porcelain Baths.

Porcelain Lined Baths.

Copper Baths.

Shower and Needle Baths.

Seat Baths.

Monarch Porcelain Kitchen Sinks.

Onyx Lavatories.

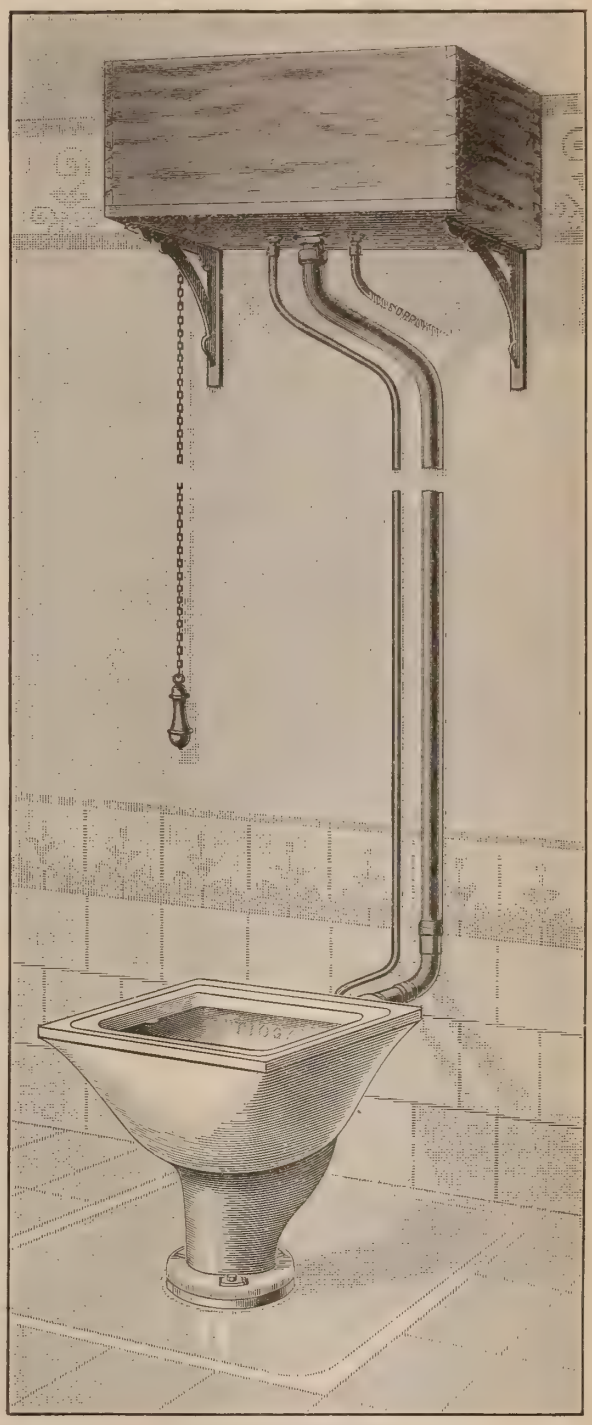
Marble Lavatories.

Nickel-Plated Range Boilers

Etc.

THE "TIOGA."

ALL PORCELAIN. SQUARE TOP. SIPHON CLOSET.



No. 82. Plate 905.

Illustrated Circular Mailed on Application.

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The undersigned have show rooms at

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with water attached.

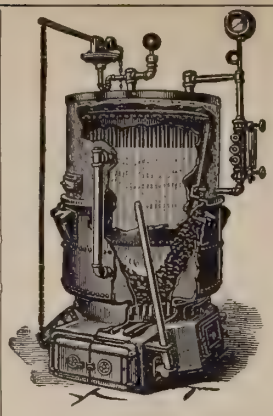
We invite all who contemplate drawing specifications to call and examine our goods that we may explain their merits to them.

HENRY HUBER & CO.,

Manufacturers of Sanitary Specialties

JOHN L. MARTIN, Manager Western Branch

Main Office, 81 Beekman St., New York.



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Automatic, Self-Feeding, Wrought-Iron, Tubular, and Sectional.

The position of the coal pockets is such that the reservoir can be as easily filled as an ordinary kitchen range. Hundreds in use, giving entire satisfaction. Our new book on Modern House-Heating, furnished on application.

IT BURNS THE SMOKE! THE GORTON SOFT-COAL BOILER.

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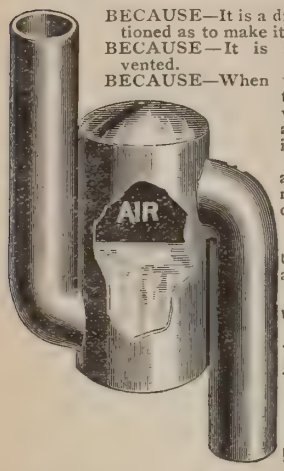
THE CLEAN SWEEP

Non-Syphon Sewer Gas Trap

IS THE BEST AND CHEAPEST.



BECAUSE—It is a drum trap, so proportioned as to make it self-cleaning.

BECAUSE—It is non-syphoning, unvented.

BECAUSE—When vented the vent is taken out above the water level making it almost impossible for it to get stopped up.

BECAUSE—It has a large trap screw, making it easily accessible.

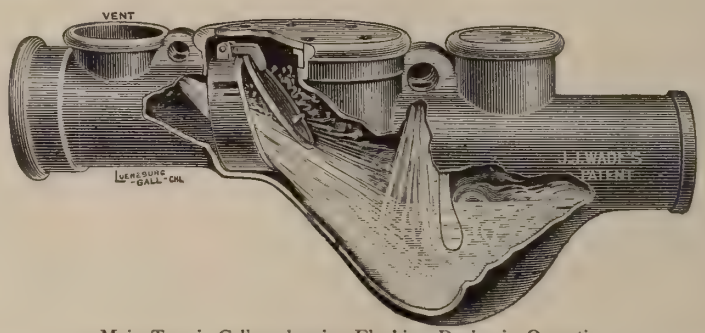
We are giving the trade a scientific trap at a low price.

If you use it once you will use it always.

Detroit Sanitary Supply Co.,

37 First Street,

Detroit Mich.



Main Trap in Cellar, showing Flushing Device in Operation.

THE WADE PATENT FLUSHING FITTINGS

Are made of extra heavy Iron, and are capable of resisting 250 lbs. pressure. The Cover perfectly tight, being screwed against gasket, but may be easily removed.

The particular advantages derived from the use of these fittings are that the owner may at any time inspect the condition of his sewers; when flushing becomes necessary a hose can be attached, and the cleansing performed in this easy manner, or they may be connected direct with the Main Water Supply. They are made to be used with either Clay or Iron Pipes.

The Fittingsare so constructed that a Back-Water Gate may be attached, thus preventing the flooding of Cellar. They are an infallible protection against Sewer Gas.

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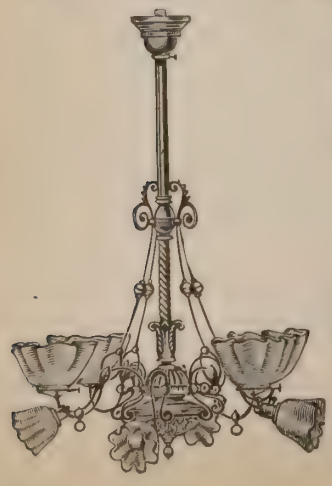

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Address all communications to The Sanitary News, 90 La Salle Street.

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If the progress of plumbing for the last decade could be shown at the World's Fair, it would prove an interesting, instructive and important exhibit of itself.

The Legislator who works and votes for the defeat of laws regulating plumbing, should be made to live in a house defectively plumbed until he discover the necessity of good plumbing.

The columns of The Sanitary News are always open for the discussion of all matters of interest within its province. We will be pleased at all times to hear from members of the trade regarding affairs affecting their interests.

Elsewhere in this issuse will be found instructions to delegates attending the Ninth Annual Convention of the National Association of Master Plumbers' to be held at Cincinnati June 23, 1891.

The older the country grows the more immediate and pressing will become the solution of the problem of sewage disposal. The pollution of streams by sewage will make its evils more mainfest as population increases until there will come a day when the necessity of some other method of disposal will have to be met and its demands granted. The evil is already a serious one.

The 23rd of June is approaching, which means the assembling of the Master Plumbers in convention at Cincinnati.

The World's Fair will be incomplete if there be not a creditable sanitary exhibit provided for. This matter is too important to receive any indifferent consideration. It is now time to be moving in this direction.

It should be understood that the plumbers follow their trade for the purpose of making money. There are other diversions which would afford more pleasant recreation if that were the object sought. It is hard work and important work. It is the highest class of skilled work, and demands good pay. Besides no one can better afford to pay good prices for anything than he can for good plumbing.

One thing is certain: The day of the tinker is past. There is now no excuse for skin plumbing. If a builder finds such a job on his hands, it is his own fault. The master plumbers have made it possible for every one to secure good work and a perfect sanitary job. The means for obtaining this are in the reach of all, and he who neglects to secure good plumbing should be held responsible.

The outcome of the interest awakened by the progress of sanitary science are new enterprises designated at "Healtheries." London we believe was the first to possess an institution of this kind, and now New York is to follow with what is known as the American Healtheries Company. The object of these healtheries is to assist in preventing the use and sale of adulterated foods and to keep the people informed as to the character of food products placed upon the market. The foods now on the market are to be given a chemical and microscopical examination and the character of the foods is to be published. These will be issued in bulletin form and give the pure and adulterated foods prepared for general consumption. The projectors of this scheme do not expect to charge for this information, as they believe that an annual exhibition will pay all expense and leave a profit which will be devoted to the erection of a permanent building for the "healthery." This is not all visionary. It will be seen that manufacturers of food products will recognize the necessity of having their food articles on exhibition, as it will be a kind of guarantee of genuineness which they will have to possess before they will be admitted to the "healthery" exhibit. Of course one article could be made for exhibition and another for sale, but as the articles of food on the market will be analyzed, adulteration will be detected, and that manufacturer's goods will be so branded. The enormous extent to which adulteration is carried calls for some vigorous remedy and this new enterprise may be the means of securing purer food.

Plumbing work is no toy. It is a serious business, and its possibilities for good or ill places it foremost among the important features of building interests. It can be made the means of bringing disease and death into the home, or it may be made the agency to shut out dangers and render the home happy and heathful. Home builders should remember this and carefully select plumbers competent to do good work. Avoid the interlopers of every description.

TO SECURE GOOD PLUMBING.

That the public needs educating up to a proper recognition of the importance of plumbing there can be no question. We find evidences of it every day, and the question arises, by what means can this education be given? How can the importance of plumbing in relation to health be best impressed upon the public mind? In cities we know that many of the diseases which swell the death rate find their ways into homes through defective plumbing. Poor plumbing work or work out of repair remains in a dwelling breeding disease and none is the wiser until a case of sickness points to some cause which is found in defective plumbing. This can be but the result of ignorance. No one would knowingly permit such poor sanitary conditions to remain. How can this ignorance be replaced by that knowledge which will secure the banishment of these evils? The plumbers as an association have done their part. They have made it possible for only good work to be done if the proper steps be taken to secure it. It now remains to instruct the people in regard to the importance of proper plumbing and the means of securing it.

Boards of Health send out from time to time printed instructions to the people relating to the prevention of diptheria, scarlet fever, typhoid, small pox, etc., which perform a valuable service. They are instructed in regard to notification, isolation, disinfection. and the proper course to be pursued in case of any of the preventable diseases. These circulars direct plainly the course to be pursued to prevent an epidemic of any of these diseases, and have no doubt been the means of preventing much sickness and many deaths. Not only this, but other boards of health and health officers of other cities, counties, and states are promptly informed of the prevalence of any of these communicable diseases and given time and opportunity to take measures to prevent their spread. In some of our better organized states, Michigan for instance, the system has been made so perfect, that many diseases have been stopped with the first case. Such system is admirable and highly commendable. It should be encouraged and promoted by the co-operation of all persons. It means the security of health and the saving of life. It prepares the people to aid in the protection of themselves against disease and educates them in the practical requirements of sanitation.

Defective plumbing is not a disease, but the cause. It is not epidemic but constant in its effects. It is not visible immediately in its work as is disease, yet it is the cause of disease which call for active measures for the prevention of epidemics. Why could not the public be properly informed regarding the nature of plumbing, the importance of inspection and repair in much the same way it is regarding the prevention of diseases? In cities it would not be at all difficult to furnish the people with information regarding plumbing, which would properly direct their attention to this important feature in every home. Circulars could be sent them plainly setting forth the requirements of sanitary plumbing work. The means by which good work could be secured could be pointed out, and the measures for repairing defective plumbing could be presented. This would set the people to thinking and the trouble now is they do not think about this important matter at all. It would also prevent them from being imposed upon by the Cheap Johns and tinkers who have no rights in the trade. It would be a service to the people which would result in healthier homes and lower death rates in our cities.

THE SMOKE NUISANCE.

It has been clearly demonstrated that the smoke nuisance can be abated in Chicago. It has been accomplished to a discernible extent, and there is every reason to believe that the employment of the means and methods which have so perceptibly lessened this nuisance, will abate it entirely. It having been thus demonstrated that it is possible to abate the smoke nuisance, the duty of the proper authorities is clearly defined and fixed in this regard. The success which has attended the efforts thus far to prevent smoke, leaves no excuse possible for a failure in this direction, and its non-prevention will now stand as evidence of a lax-administration of the offices bearing this important duty. It cannot now be said that it is beyond the power of the authorities to abate this nuisance. There is nothing left for them to do but either abate the nuisance or acknowledge an unwillingness or inefficiency to do so. The fact that this work has been turned over to the new administration so far advanced that its success has been widely acknowledged, places a greater obligation upon the authorities for promptness and effectiveness in the eradication of this great evil. The day of investigation and experiments is past and there is now nothing called for but practical effective work. The means and methods have been discovered, but they in themselves will not abate the nuisance; active, energetic, capable work is needed to put them into successful operation. The difficulties of the work have been overcome, and there now remains the application of the discovered means to the attainment of this important end.

It is hardly possible that a matter so important to the health and comfort and commercial interests of a people will be neglected. Public interest in this matter is too great to be disregarded or indifferently served. It calls for immediate, effective and continued action, and the seriousness of the evil is so constant and so menacing that diligence in service is imperatively demanded. We trust the present administration will make a record for itself, and give us a city clean, respectable and healthful. It is not the larger and older offenders only that need watching and stringent measures. The smaller ones add their portion to the nuisance, and the means applied to the larger ones should be as diligently applied to the smaller offenders. Smoke is smoke whether it issue from many stacks or one, or from large or small ones. To abate the evil, attention must be paid to details, for from many sources comes the aggregate which makes the nuisance so great.

It should be remembered that the smoke inspector's duties are onerous, and he should have the co-operation of every citizen. He needs the aid and moral and active support of all. It is this support that will make his efforts efficient. He could do nothing against the opposition of those whose interests he serves. If the people want the smoke nuisance effectually abated they must aid in the work, and there is all reason to believe they will. The object to be attained is well worth every effort necessary to secure it.

NOTES AND NEWS.

The trustees of Columbia college have determined to devote the late Mr. Charles M. DaCosta's bequest of $100,000 towards a laboratory of biology.

Dr. Dowd, of New York, has been making a careful study of the number of germs found in the soil, which is known to be everywhere swarming with these minute organisms. The number of germs present in a cubic inch of soil was found to vary from sixty thousand to two and one quarter million.

The quantity of water used for extinguishing fires in London during the year 1890 was between 20,000,000 and 31,000,000 gallons, or about 92,000 tons. Of this quantity about 8,000,000 or about 40 per cent. of the whole, was taken from the river, canals, and docks, and the remainder from the street pipes.

The total number of boiler explosions which occurred in the United States during 1890 appears to be 226, as against 180 in the previous year, the number of persons killed and injured being 244 and 351 respectively. No less than 75 of the whole number of explosions took place in connection with saw mills and woodworking establishments, while 25 cases of locomotive boiler explosion are recorded.

Sanitary administration, says Erastus Brooks, means not only personal comfort and health in the family, but economy to the estate and family. Two hundred and fifty-thousand lives lost, three million cases of sickness and 20,000,000 in money are traced, in one decade in England alone to neglect of sanitary care. The sword and musket are terrible ministers of death, but even in armies, where battles kill one person disease kills at least three.."

The Committee on Public Health of the Massachusetts Legislature recently passed a resolution that the State Board of Health should undertake an investigation into the dangers to human life and health arising from tuberculosis in the food products of cattle. It was recommended that authority be given to spend a sum not exceeding $15,000 on the inquiry.

The last Supplement of the *British Medical Journal* (Ap. 4. inst.) points out that in examining water for typhoid bacillus the sediment should always be used. There was an outbreak of typhoid fever amongst the boys of a school, following a similar outbreak in neighboring houses. There was found to be a dangerous proximity of the spring from which the water was derived to the closets in the schoolyard. Examining the water by the ordinary gelatine plate method, the author was unable to find any traces of the Eberth Gaffky bacillus; but on allowing the water to stand and making cultivations from the sediment, there appeared among others, characteristic colonies, the bacillus of which, in staining and microscopic appearance, could not be distinguished from those of the typhoid bacillus.

In a paper read by Mr. Joseph W. Richards before the Franklin Institute, on "The Aluminum Problem," it is suggested that the reduction of aluminum by carbon in the Cowles and Heroult furnaces is due to the fact that the alumina is presented to the carbon in a fluid condition. The reduction takes place at a temperature not far above the melting point of alumina, viz., 2,600 deg. Cent., and Mr. Richards considers it would be worth trying whether alumina cannot be presented in a liquid condition, to the action of the carbon, at a much lower temperature by dissolving it in some such salt as cryolite, which seems to dissolve mechanically at about a red heat.

SPECIFICATIONS FOR PLUMBING WORK.

The following is reproduced from the *Metal Worker* of March 21:

There is a growing tendency in this country toward a greater exactness in the specification of labor and materials required in the construction of houses. In the newer countries there is always more or less laxity in this matter, but as competition increases and the trades become more clearly defined, it becomes necessary to specify exactly what is required in buildings. A trade intimately connected with the building industries, in which there is often too much indefiniteness in the specifications, is plumbing, but we look for the time when the number and position of the fixtures, the position, weights, sizes of pipes and all the material in the plumbing work of the house will be definitely stated in the specifications. An illustration of the tendency of the times is afforded by the action of J. D. Sibley, architect, Middletown, Conn., who has published for his own use blanks to be employed in occupying the plumbing work for houses. The blanks are made up in form of pamphlets, containing 12 pages each. On the first page room is left for recording the situation of the house and the name of the owner; and reference is also made to the general drawings accompanying the specification. Before coming to the actual specification blank there is a page of notes defining the responsibilities in the work and the duties of the different contractors. The specification proper consists of four pages of printed forms, with blank pages opposite for the addition of anything that may be necessary, as, for instance, in the case of heating, which is left entirely for manuscript insertion. As the work of tinning and plumbing are so very intimately associated, particularly in the country districts, it is natural of course that the tinning contract should be included with the plumbing. Perhaps there would be differences of opinion upon some of the requirements included in the plumbing specification, but the fact remains that the advantage of having all the work definitely stated beforehand is of immense importance. At the end of the pamphlet is a note stating that the subject matter of it is equally binding whether written or in print, and any notes on any of the drawings are to be considered part of and are equally binding with the specifications. The form is as follows:

TINNING.

For all roofs that are tinned, use laid on in the best manner, and secured with clips and soldered, unless otherwise specified.

Furnish the carpenter with 14" tin vallies—same kind of tin as specified for roof.

All sunk gutters to be lined with same kind of tin as specified for roofing, with the edge brought over and nailed every two inches to the crown mold of cornice, and to run up under slate or shingles to make a tight job. Gutters to pitch to location of leader pipes.

Prepare, lay on and secure to roof 20" gutters, formed up ready for the carpenter to shingle in.

All hanging gutters to be properly secured to the roof with brackets and straps.

Put up in the best manner corrugated, galvanized iron leaders, to take the water from the roof to the ground. Furnish all the necessary elbows, bends, &c., to connect the leaders with the gutters and to deliver the water to the cast-iron pipes below specified, or to turn the water away from the building at the bottom of the leader.

Furnish and put in inch for main house, inch for additions, and inch for verandas, &c.

Furnish and put in from grade level to main pipe cast-iron pipes at the foot of the leaders, the same size inside as leader pipes, closely connected with leaders and drains, and not to project more than inches above grade.

The tinner will see that the painter paints all gutters, vallies and flashings before they are laid. The tinner shall run the tin work up under clapboards sufficiently to secure the building against leak wherever the tin roof abuts against the building; do all the necessary tinning to make all water and weather tight, if specified or not. Leave the building proof against leak, and warrant for one year after finishing.

PLUMBER.

Furnish all the materials and labor necessary in the execution and entire completion of the plumber's work, in accordance with the full intent and meaning of this specification and the accompanying drawings. All the materials to be the best of their several kinds. The work to be done in the best manner, reference being had to specification of other trades for full description.

The contractor is to obtain all permits and pay all charges therefor, and do all excavating required for his work.

Tap the water main in the street, and supply the house with water through inch galvanized wrought iron pipe, laid below the action of the frost, to the inside of the cellar wall, and from thence continued along to a point underneath the hot-water boiler, leaving the necessary out-branches for the several fixtures the pipe to have inch lever handle stop and waste cock of unfinished brass, located at a point that will insure the drainage of all pipes in the building. Each tenement to have independent water service from the and each to have a stop cock as above.

The water to be laid on to the building at the commencement of the work for the use of the masons.

DRAINS.

Do all excavating for, provide and lay, where shown on the plan, Akron salt-glazed drain tile, of sizes shown, all laid to proper and even grade and the joints laid in cement, and all left clear and perfect when all is done. Furnish and put in all the necessary Y's, T's, elbows, bends, traps, &c., to make a complete job. Connect closely with the sewer in street. When the sewer is laid, fill in, and on the outside settle with water in order to pack the earth closely.

SOIL PIPE.

Connect with the drain and run up through the house and continue to feet above the roof, a inch cast iron soil pipe, terminating in a ventilating hood. Soil pipe to be coated inside and outside with gas tar applied hot; to be properly secured in place and supported with wrought iron hooks, pipe-rests &c. All the joints to be properly calked with oakum, run with melted lead and calked.

Where the soil pipe comes through the roof, to be made perfectly tight by calking three pound sheet lead into the joint of pipe and dressing out over roof as required. Off-set pipe where required to clear walls, timbers, &c. Furnish all the necessary Y's, T's, bends, etc., for the various connections, and to make a complete job.

BOILER, &c.

Provide and set where indicated a gallon galvanized iron or copper boiler, of the most approved manufacture, with all the latest improvements for safety, &c.; set on a single-leg cast iron standard. The boiler to be connected with adjoining range by ¾" heavy pipe and provided with ¾ inch sediment pipe and brass hose bib to empty and cleanse the boiler at will, or to have brass cock and to connect with nearest waste. Put stop and waste cock of finished brass over boiler to shut off water at pleasure.

WATER SUPPLY.

Supply the various works with hot and cold water through ¾" pipe.

KITCHEN SINK.

Furnish and set up in the where shown a cast iron sink, and supply it with hot and cold water; inch pipe and finished brass compression cocks. Cold water to have hose bib. The sink to waste through 2" C lead pipe, with heavy lead trap, with brass trap screw, and connected with adjoining soil pipe or drain in the cellar.

BUTLERS'S SINK.

Provide and fit up complete where shown a 14" x 20" 14-oz. copper, tinned and planished, butler's sink with oval bottom. Supply with hot and cold water through ½" pipe and 2-lb. lead pipe, and nickel plated pantry cocks and plated plugs, chain and chain stay complete. The sink to waste through 1½ C lead waste pipe, heavy lead trap, with brass trap screw, and to connect with adjoining soil pipe or drain the cellar.

WASH TRAYS.

The wood work of the wash trays to be provided and set in place by the carpenter. Each tray supplied with hot and cold water through ¾" pipe and ¾ inch finished brass tray cocks and 1½" plug and brass chain.

Trays to waste through 1½ C lead waste pipe, with heavy lead trap between wash trays and soil pipe or sewer connection.

WASH BASINS, &C.

Provide and fit up where shown on the plans marble pattern wash basins, set in 1¼" marble countersunk slabs with molded edges; to have marble sides and backs, ⅞" thick; sides and backs 8" high. The basins fitted up with nickel plated basin cocks, plugs, chains and chain-stays complete, and to be supplied with hot and cold water through ½" and ½ inch 2 lb. lead pipe, and heavy lead trap, with brass trap, screw, and connected with soil pipe or drain in the cellar.

BATH TUBS, &C.

Furnish and fit up complete in the bath room a 14-oz. stamped and guaranteed, tinned and planished copper bath tub, size shown on plan, and with overflow connections. Supply with hot and cold water through the necessary inch pipe, and ½ inch 2 lb. lead, and ½ inch compression plated bath bibs. The waste to be 1¼ inch C lead, with heavy lead trap and brass trap screw, and to connect with soil pipe. To have plated plugs, chain and chain stay.

WATER CLOSET, &C.

Furnish and fit up complete, where shown on plan, water closets as specified on opposite page, properly connected with soil pipe.

SAFES.

Place safes of 3 lb. lead under all fixtures above first story. Safes to cover the whole area occupied by the fixture in each case; to have edges turned up 2 inches all around, and to have ¾" waste pipe, with convex brass strainer run down below the cellar ceiling, with the ends left open.

VENT PIPES.

Run 1¼ inch and 2½ lb. lead vent pipes from the crown of all traps not otherwise specified, and connect with soil pipe above all fixtures, or 2 inch cast-iron ventilating pipe put in for the purpose, if not convenient to the soil pipe.

GAS FITTING.

Pipe the house for gas in the best manner, in accordance with the regulations of the Middletown Gas Company, with outlets as shown by stars for drop lights and 3-pronged branch for bracket lights, indicated on the several plans. Connect with the gas company's pipes and with meter.

The pipes to be the best quality wrought iron gas pipe, and all the fittings to be malleable iron, all put together with red lead, capped and tested and proven tight before any plastering is done, and the caps left on. All the pipes to be laid with a fall towards the meter, which is to be located at a point indicated by the owner. All the pipes to be secured with strong hooks and bands. The gas fitter is to call upon the carpenter to do all cutting of timbers, and all cutting to be as near bearings as possible; and in no case must the timber be weakened by the cutting.

All nipples to be of the proper length for putting on fixtures without alteration, and all to be perpendicular to the wall or ceiling from which they project.

GENERAL REQUIREMENTS.

All lead waste and vent pipes, C. lead. Supply AA. All lead pipes connected to iron soil pipe or iron vent pipes are to have brass ferules soldered to the lead and calked into the iron pipe with oakum and molten lead.

All lead supply pipe connected with galvanized wrought from iron pipe to have brass nipples soldered to the lead pipes.

All joints on lead pipes to be plumbers' wiped.

All lines of hot and cold water pipes must have a constant grade, to allow proper circulation and perfect drainage from the lowest point.

No supply pipes to run on outside walls unless absolutely necessary, and in such case the pipes are to be securely protected in all exposed places by a packing of mineral wool or such other proper substance as may be deemed best.

All the work that is specified plated, to have heavy nickel plate.

All pipes to be put in and tested, as far as practicable, before the floors are laid and the plastering commenced.

THE NINTH ANNUAL CONVENTION.

Through the kindness of President Griffith we are enabled to publish information for the delegates attending the Ninth Annual Convention of the National Association of Master Plumbers, regarding railroad fare and hotel rates. The following has been issued as instructions to delegates concerning railroad fares:

Through the courtesy of the Central Traffic Association, persons attending the National Association of Master Plumbers to be held at Cincinnati, Ohio, commencing June 23, 1891, will be granted a reduction in their return railroad fare only, under the following circumstances and conditions:

First. Each person must purchase (not more than three days prior to the date of the meeting nor later than three days after the commencement of the meeting) a first-class ticket (either unlimited or limited) to the place of meeting, for which he will pay the regular tariff fare, and upon request the ticket agent will issue to him a certificate of such purchase (Form 2), properly filled up and signed by said ticket agent.

Second. If through tickets cannot be procured at the starting point, the person will purchase to the nearest point where such through tickets can be obtained, and there purchase through to place of meeting, requesting a certificate properly filled out by the agent at the point where second purchase is made.

Third. Tickets for the return journey will be sold by the ticket agents at the place of meeting at one-third the first-class limited fare, only to those holding certificates (Form 2), signed by the ticket agent at point where through ticket to the place of meeting was purchased, and countersigned by the secretary or clerk of the convention, certifying that the holder has been in attendance upon the convention.

Fourth. It is absolutely necessary that a certificate be procured, indicating that full fare has been paid for the going journey, and that the person is therefore entitled to the excursion fare returning. It likewise determines the route via which the ticket for return journey will be sold, and *without it no reduction will be made*, as the rule of the association is that "No refund of fare can be expected because of failure of the parties to obtain certificates."

Fifth. Tickets for return journey will be furnished only on certificates procured not more than *three days* before the meeting assembles, nor later than *three days* after the commencement of the meeting, and will be available for continuous passage only; no stop over privileges being allowed on tickets sold at less than

regular unlimited fares. Certificates will not be honored unless presented within *three days* after the date of the adjournment of the convention. It is understood that Sunday will not be reckoned as a day.

Sixth. Ticket agents will be instructed that excursion fares will not be available unless the holders of certificates are properly identified, as above described, by the secretary or clerk, on the certificate, which identification includes the statement that one hundred or more persons, who have purchased full fare tickets for the going passage, and hold properly receipted certificates, have been in attendance at the meeting. A violation of the rules in certifying that the stipulated number were in attendance, when actually a less number of properly executed standard certificates were presented, will debar the offending organization from the further courtesies of this Association.

Seventh. The certificates are not transferable; and the signature affixed at the starting point compared with the signature to the receipt, will enable the ticket agent to detect any attempted transfer. A transfer or misuse of certificates or tickets authorized under this rule will forfeit all privileges granted.

N. B. Please read carefully the above instructions, be particular to have the certificates properly filled and certified by the railroad agent from whom you purchase your going ticket to the place of meeting, as the reduction on return will apply only to the point at which such through ticket was purchased.

The following has been issued giving hotel rates, headquarters being established at the Gibson House:

Grand Hotel, American plan, $2.50-$3-$4, according to location of the room.

The Dennison House, Main and Fifth streets; $2-$2.50 per day; special rates for convention, $1.50.

Hotel Emery, European plan; $1-$1.50. American plan, $2-$2.50 for each person.

Burnet House, American plan; $3-$5 per day.

The Stag Hotel, European plan; rooms from 50c.-$1.25.

IOWA MASTER PLUMBERS.

The master plumbers of Iowa closed their second annual convention the sixth inst. at Sioux City. The convention was a pronounced success, and a great deal of important business was transacted.

The following officers were chosen for the ensuing year:

C. T. Fitts, of Sioux City, president; Henry Ewinger, of Burlington, vice-president; John E. Allen, of Des Moines, secretary; A. H. Walker, of Des Moines, treasurer.

Auditing Committee—William Ellemund, D. W. Fitts and J. A. Harris, all of the city.

A resolution was passed providing for a legislative committee to confer with the state board of health, at such times as the president of the board of health may designate. The committee appointed consists of C. T. Fitts, of Sioux City; James Cameron, of Davenport; Henry Ewinger, of Burlington; E. H. Malter, of Ottumwa; Ben Bolman, of Clinton; Gunton Hauser, of Muscatine; and J. A. Hanger, of Fort Madison, The purpose of this committee is to work in conjunction with the state board of health in securing the passage of a law requiring all plumbing work to be inspected by competent inspectors, to be appointed by the state.

The delegates to be chosen by the local association throughout the state to the national convention to meet in Cincinnati in June were instructed to vote for H. F. Hogan, of Sioux City, as vice-president of national association for the state of Iowa.

Two South Dakota Plumbers, Beggs, and Ferris, of Sioux Falls, were admitted as members of the association, owing to the fact that the association has not been organized in South Dakota.

Before the adjournment of the afternoon session Robert Griffith, national president of the master plumbers, moved a rising vote of thanks to the Sioux City plumbers for their generous entertainment, and to Mayor Palmer, the press of the city and cable and electric car lines for their kind and courteous treatment. The vote was carried unanimously.

Davenport was selected as the place and April as the time—the exact date to be determined by the executive committee—for holding the next annual convention.

The closing was the banquet and it proved a most enjoyable occasion. The plumbers who composed the company proved themselves as capable in gastronomic feats as in those relating to sanitary regulations. They enjoyed themselves thoroughly, and that they did so need occasion no surprise. There was the hearty good fellowship that is the essential requirement of enjoyment at a feast, and the cheering cup, the fragrant cigar and the sumptuous spread to stimulate enjoyment.

At the head of the long table in the dining-hall sat President Griffith, of the national association, and Mayor Palmer. Ranging on either side of what was truly a bounteous board were the members of the convention, of which the banquet was the benediction. After the menu had been considered for an hour and approved, as all evidences indicated, some informal after dinner speeches were indulged in.

President Fitts, of the state association, introduced Mayor Palmer, who said a few words of welcome and of appreciation on the part of Sioux City that the convention had been held here.

National President Griffith made quite an extended speech on the importance of the plumbing trade to the health of the country and the need of the education of public sentiment until the country could appreciate the necessity of the best plumbing work from the best workmen, regardless of the extra expense that might be required. He especially emphasized the need of earnest work at Des Moines next winter to the end that state laws regulating the plumbing trade in certain ways might be enacted.

J. E. Burnside, a blithe Scot from Des Moines, sang a few of old Scotia's songs with good effect. After a few remarks by President Fitts, J. E. Gearen, of this city, responded to a call with an Irish melody. There were short talks from Messrs. Cameron, of Davenport; Ewinger, of Burlington; Beggs, of Sioux Falls, S. D.; Harris, of this city; Secretary Allen, of Des Moines; Kilduff, of the Crane Manufacturing Company, of Omaha; Drilling, of the Nelson Manufacturing Company, of St. Louis, and others.

Secretary Allen referred in his remarks to the encouraging growth of the association. At its first annual convention in Des Moines it had sixteen members, and at this, its second annual convention, it numbered forty-eight members.

THE OTHER VERSION.

Mary had a little lamb
Its fleece was white as snow,
And everywhere that Mary went
The lamb was sure to go.

It went with her to school one day
Diphtheria was there too,
The germs lodged in the snowy fleece
And Mary breathed a few.

Now when the lamb is out at play,
It always plays alone,
For Mary sleeps the time away
Beneath a cold gray stone.

CONVENIENT TO HAVE ABOUT.

It is found that by placing layers of hair felt under the foundation of steam engines and dynamos, noise and vibration are materially deadened.

To remove the white efflorescence which some times appears on the face of brick work, wash the surface with a sponge dipped in a weak solution of muriatic acid.

Porous terra cotta is said to be the best fire resisting substance except asbestos, used in buildings.

The *American Machinist* says that vaseline is one of the best things for preventing bright iron work from rusting.

It is stated that copper piping when hot has an injurious effect upon any india-rubber tubing with which it may come in contact.

The Austrian Hydrographic Bureau adopts the following method of making paper transparent for copying drawings: The sheet of paper being placed over the drawing to be copied, it is lightly rubbed with a ball of cotton saturated with pure benzine. The tracing can then be readily made, owing to the resulting transparency, and the benzine on evaporating, leaves the paper opaque as before, and without any trace of odor. Absolute purity of the benzine, however, must be insisted upon to secure good results.

The *Cigar and Tobacco World* gives the following useful recipe to prevent steel from rusting: Boil together a mixture of turpentine and sulphur, and after it is cold apply with a camel hair brush. When the turpentine evaporates, there remains on the metal a thin layer of sulphur, which unites closely with the steel when heated for a minute or two over a spirit or gas flame. This protects the metal perfectly, and is quite durable.

John Klar, of Westfield, O., has perfected a method that will bring marble to its highest possible gloss under an elbow or any rotary machine without the use of grits or acids, by substituting a hard wood or rubber band and fine emery. This is a valuable addition to the marble workers' methods and Mr. Klar will not protect his discovery by a patent, preferring that all may use it who choose.—*Stone.*

One of the most beautiful woods for interior finish when properly treated is white pine. It should, of course, be stained and not painted, and the staining should not be in imitation of the more expensive woods. The grain, which is beautiful in itself, having a velvety softness of texture, loses its beauty when stained to imitate walnut or cherry, for it shows us at once that a sham has been attempted. But there is no reason why stains should be avoided. On the contrary, many very artistic effects can be obtained by the use of various colored stains, such as green in varying tones and light brown and yellow colors. Some of the aniline dyes seem to make good and effective colors for this kind of work.

THE SANITARY ENGINEER AND HIS WORK.*

(Concluded from page 6.)

Assuming that the condition of the house has now been proved to be utterly bad, let us glance at the steps necessary to be taken to put it into a good sanitary state. First comes the entire removal of all old and defective work and insanitary appliances from the premises, not forgetting all buried and hidden pipes and sewage-contaminated earth, the latter being replaced by clean dry earth, plentifully mixed with lime and well rammed. The next thing to decide is the course of the new drains and the choice of material, whether iron pipes or glazed earthenware ones shall be employed, as the question of concrete under and around them hangs upon this. For use under houses, particularly where the soil is of an unstable character, or where constant vibration occurs from heavy traffic on an adjacent road or railway, iron is undoubtedly the best. These pipes should be the heavy ones especially made for drainage purposes, with large sockets having the joints well caulked by a skilled workman with gaskin and metallic lead. Proper caulking tools can alone thoroughly accomplish this. Oxidation may be guarded against by coating the pipes within and without with Dr. Angus Smith's composition. This is best done at the foundry.

The auther in all such cases in his Government work used iron protected by the Bower-Barff process. This is somewhat expensive, but admirable. Other advantages of iron are that a considerable settlement of the building does not disturb the drains, little or no concrete is required, and in some cases the pipes may be fixed to the walls in the basement so as to be always in sight. In America iron is very extensively used with good results. In this country the North British Plumbing Company have been largely instrumental in adapting and introducing it for house drainage. Pipes of this material will safely bear pressures from heavy superincumbent clays, etc., which would speedily crush the ordinary pipes used for sewers and drains. Concrete tubes have been somewhat largely used for sewers. *En passant*, reference may be made to the very great value of a knowledge of geology to the sanitary engineer. The two most troublesome cases out of some thousands which have now passed through the author's hands were houses upon the London clay—and awful stuff it is—one upon the summit of Kingston Hill and one in Clapham Park.

If stoneware pipes be selected, they should be of the very best manufacture, true in line and section, tested under hydraulic pressure before use, and jointed with Doulton's or Stanford's joints, with an outer protecting coat of Portland cement, These pipes should be entirely surrounded by six inches of Portland cement concrete. Of course the drains must be laid in absolutely straight lines from chamber to chamber, with uniform falls, and at every important junction or change of direction, an access-chamber with air-tight cover should be provided. Every inch of the drainage system is then readily accessible, and accidental stoppages can be removed in a few minutes. Every foot of pipe possibly carrying sewage must be kept outside the building, as well as all access-openings and ventilating pipes. Experience has shown that joints made air-tight by the introduction of rubber are not long reliable. Asbestos, a practically imperishable material, is now generally superseding it, Undoubtedly the best material for soil and ventilating pipes is lead, in the form of the heavy hydraulic drawn pipes now so familiar to most of us; 7 lbs. or 8 lbs. per foot super is none too heavy, and three broad and heavy double lead tacks should be soldered to each 10 feet length. Plumber's "wiped" joints only to be used; all pipes to be straight when possible, and all bends to be easy ones. The bend at the foot of a soil-pipe is generally a weak spot. No trouble is too great to make this solid. In the course of years it has to bear the impact of tons of falling water, and if it can be moved, it certainly will. The leading feature in all true sanitary work is to make all conduits and appliances as absolutely self-cleansing as may be. You see before you a few good instances of such fittings, Bolding's and Houghton's gullies, etc. These are merely typical of many good sanitary fittings now to be had. To unite pipes or fittings of like material is an easy matter, and it is a good rule to join on the drain side of the traps under fittings only iron to iron, lead to lead and stoneware to stoneware as far as possible. The only good way to join a lead pipe to the socket of an iron one is by means of a stout brass connecting piece, soldered to the lead and caulked into the iron in exactly the same way as above described for uniting iron pipes. All waste-pipes more than 2 or 3 feet long should be ventilated from their upper ends into the open air, to prevent trap-syphonage, and every w. c. branch should have a similar anti-syphonage pipe, 2 inches diameter, carried from its upper end to a point well above the roof. A cheaper and, where the building is a lofty one, a better plan is to terminate such pipes in the soil-pipe ventilator, some 4 feet above the top connection, as friction is thus reduced. A good fall to specify for house drains is 1 in 30, although a less fall is sometimes quite sufficient.

Hot water must on no account be allowed to pass down a lead soil-pipe. The best solution of the troublesome question of "slops" is to make the top w. c. a combined slop-sink and w. c., by using a wash down basin with lead trap (Tylor's, Hellyer's or Bolding's), and fitting it with a dished, white-glazed earthenware slop-top, hinged seat and noiseless three-gallons syphon-action flush tank. The "wash-out" closet is no longer looked upon as a sanitary fitting by the best—because competent and independent—judges. No stoneware trap should, under any circumstances, be fixed up-stairs. No urinal should be fixed in or near a house, unless fitted with an automatic "time-flushing" cistern, and large lead or copper flushing-pipe. Nothing else will keep them sweet The only really self-cleansing, and therefore sanitary latrine known to the author (and he believes that he knows all in the market) for school and barrack use is the one made by Dent & Hellyer. The author fixed the first one publicly used at the Horse Guards, and it answered admirably. It is supplied, like most others, by an automatic flush tank, but its superiority over all others results from the arrangement by which the latrine itself syphons-out, an after-flush from the tank leaving it again charged with clean water.

With regard to drain-ventilation, the only two good "low-level" air inlets safe to use in the contracted front area of the average town house are exhibited. The constant momentary reversals of the air-current make it absolutely unsafe to leave an unprotected drain opening near a door or window. A real danger, constantly overlooked is frequently caused by leaving the upper open ends of outlet ventilating pipes unprotected from "down blow." A walk along the Marine Parade at Brighton—doubtless well known to most of you—gives a striking object lesson of this. One may then perhaps see the most motley collection of cowls, caps, cones and windguards visible at one stretch in the world. Why? Because the prevailing south and southwest winds of this country meet the cliff, are violently directed upward, and, describing a parabolic curve, blow almost directly down the flues. The same effect is

*A paper read before the Society of Architects by C. E. Gritten, A. M. Inst. C. E., March 24, 1891.

caused by a north or northeast wind striking the high downs at the back of these houses. Exactly the same thing, in a less degree, is always happening in a town. The wind swirls over and downward from higher buildings, roofs and chimney-stacks, and there are few unprotected open pipes which do not frequently act as air inlets instead of air outlets as intended. This is one strong reason for the use of mica-valves on low-level air-inlets, In the country, or where there is open ground around a house, the best air-inlet is an open grating, at or near the ground level. Doulton makes a very good one, called "Cregeen's grid," after the inventor, which not only admits fresh air to the drainage system, but also excludes all dirt and gravel from the trap—an important point in a garden.

Another essential thing often neglected is to trap every fitting immediately under it, as quite short waste-pipes soon become excessively foul from decomposing grease, soap, etc.; and without traps air enters the house by means of these pipes whenever the internal temperature is higher than that outside, bringing a stench with it. The concrete bed under stoneware pipe drains is often scamped even on otherwise satisfactory jobs. The concrete should be laid to a proper fall and with a true surface, so that the pipes rest almost throughout their length, room being left every two feet for the joints. Probably the best system of all is to insert two bricks every two feet, removing alternate ones before the concrete sets. This gives a true surface right along.

The author is glad to have this opportunity of publicly expressing his entire sympathy with the plumbers' registration movement. Good results are following, and better still will come as time passes. Architects can greatly help in this good work, and in preventing untrained tinkers from pretending to do plumbing by adding to all their specifications the words, "All plumbing work to be done by registered plumbers." Most of my hearers are agreed, I know, in thinking the proposed registration bill for architects a very desirable measure. Only those who have practiced in a provincial town can realize how necessary it is. One objection made to it is that the names of qualified and unqualified practitioners would appear together for a time in register and directories. They do now and ever will until the act becomes law. In perhaps the most widely circulated list of British architects the first name of all is that of a builder, and not a first-class one either. A law should certainly be passed at the earliest possible date preventing untrained, unqualified, incompetent and dishonest persons from dealing with sanitary work, upon which the health and lives of the people depend in so large a measure.

One word upon certificates. The more difficult they are to obtain the greater their value, and the certificate easily granted is not worth the paper upon which it is written. The same is true of those issued by contractors, or anyone but absolutely disinterested persons. The Great Architect of the universe alone could finish His work, and then with propriety pronounce it "very good."

The author hopes that he may live to see the day when our universities and technical colleges shall have each a chair of sanitary engineering. England, who has led, and still leads the world in engineering enterprise, and has been the source from which the blessings springing from sanitary progress have spread, should surely be the first in this. At present there is but one professor of sanitary engineering, and it may surprise some of my hearers to learn where he is—in far-off Japan, which, I take it, the average Briton still regards as a half-civilized land! Professor William Kinninmond Burton, C. E., formerly a colleague of the author's, ably fills the chair at the Government College in the Japanese capital.

SANITARY INSPECTORS IN UNIFORM.

Commissionor Wingate, of Milwaukee, Wis., has issued the following rules for the regulation of the Health Department, which will take effect as soon as the new uniforms are ready:

New uniforms must be made of dark blue cloth, and all of the same shade. The uniforms must consist of an inside coat, vest, pants and hemlet, with a cap and overcoat for cold weather. Inside coat must be cut sack, double-breasted and button to the top. Vest must be single-breasted. Brass buttons adopted by the commissioner must be used on all uniforms. The overcoat must be cut double-breasted. The head covering for summer must be a hemlet of a color to correspond with the uniform, and in the winter a cap of the same color.

The officer wearing star No. 1 shall be the chief sanitary inspector, and all officers wearing stars of higher number will obey his orders. Each officer wearing a star must at all times, when on duty, be in full uniform, and uniforms must be kept clean, whole, and free from spots of any kind.

Officers must keep their hair and whiskers well trimmed at all times, and face cleanly shaven if no beard is worn.

Officers must not smoke on the street when in uniform; must not frequent saloons or drinking places, or any place of ill-repute when in uniform, unless on official duty.

Officers will report to the commissioner on Mondays and Thursdays of each week, at 11 A. M., for general inspection and instruction.

Officers on duty have full police powers under the direction of the commissioner of health, and are expected to act at all times as officers of the law in their functions as sanitary police and in such manner as to command respect from citizens.

It is of the greatest importance that a sanitary officer should appear neat and clean at all times and in every respect prove himself worthy of the important position which he occupies.

A disregard of the above rules by any officer will call for a request for his resignation by the commissioner.

TREATMENT OF SEWAGE BY THE IRON PROCESS.

The new process of treating sewage with a salt of iron seems well adapted for small and isolated areas. It consists simply in treating the sewage with a salt of iron supplied regularly in a certain fixed proportion; the effect is not merely to do away with all offensive odor, but to actually destroy all the noxious elements of the sewage, reducing it to a fine black ash; and producing a perfectly clear effluent. The iron is supplied by means of a ferrometer. This consists practically of a glass receiver, holding 30 lbs. of the specially prepared chemical, enough to last a household of fifteen persons for a week. The lower end of this receiver is perforated by a series of holes, and dips into an earthenware vessel, through which runs a constant flow of water, which gradually dissolves the chemicals, after which it is allowed to pass into the drainage system of the building. By raising or lowering the receiver in this bowl, according to a fixed scale, the rate at which the contents are dissolved may be regulated to suit the size of the household, and the flow of water is capable of similar regulation, a drop per second usually sufficing for a small household, the cost per head per year not exceeding ten pence.—*British Architect.*

GERMS IN THE AIR.

The subjective of germs is an interesting and important one. It enters the conflict against disease and is an important factor in preventive medicine. Disease germs seek to invade our homes and every one connected with building construction has to do with them. The plumber must be constantly mindful of them as he places his pipes and seals. They are inhabitants of water and air and the plumber understanding their natures is better able to shut them out of our homes and render health the more secure. The following from the able pen of Dr. J. H. Kellogg in *Good Health* is a practical discussion of these micro-organisms and will prove interesting and valuable:

Prof. Tyndall discovered, many years ago, that the motes which dance in the sunbeams are largely made up of germs. He also discoverd that when the air is kept perfectly still, so that the dust has time to settle, there are no motes in the sunbeam, and indeed the sunbeam itself disappears; for it is the fine dust in the air which renders visible the rays of light passing through it. The experiments of Tyndall, Pasteur, Koch, and many other scientists, have shown that these minute living particles commonly known as germs, more technically called microbes, are the cause of a great number of human maladies, among which are those of the most dangerous and fatal character.

The Origin of Germs.—Germs do not originate spontaneously, as was once supposed. All germs originate in other germs. Some germs multiply by simply increasing in size and subdivision, while others produce spores resembling the seeds of plants. The air we

breathe always contains more or less of these minute vegetable organisms. In deep valleys; and in streets and back alleys of cities, germs are very abundant, while the air on mountain tops is almost free from them.

How Germs Grow.—Germs, like plants, require soil in which to grow. Some of them thrive only upon dead and decomposing matter, germs being, in fact, the active agents by which fermentation and putrefaction, and all forms of animal and vegetable decomposition, are produced, Some germs are parasitic in character, and prey upon other living organisms, animal or vegetable.

The rapidity with which some kinds multiply is something astonishing; a single germ sometimes becoming two within fifteen minutes. Starting with this fact, a computation may be made to ascertain the number of these organisms which would be produced in twenty-four hours from a single germ, Germs rarely continue multiplying in this way, however; for nature has provided certain restricting conditions respecting their growth, which prevent their developing with such celerity as to overwhelm all other living things.

Germs serve some useful purposes, as in the raising of bread, and in the production of some articles which are used in various arts and industries. Even in setting up decomposition of dead animals and vegetables, they are serving a useful purpose in carrying out the fiat of the Creator, "Dust thou art, and unto dust shalt thou return."

Sources of Germs.—In this short article we shall not undertake to consider all the sources of germs, but we will notice especially the principal ones which are sources of contamination of the air In the first place, it will be readily understood that in order that germs shall be picked up by air currents and carried about by the wind, or drafts, they must be in a dried state; when wet or moist they are too heavy to float, and hence remain where they are developed. Germs are found in the air in the shape of fine particles much too minute to be seen with the naked eye, unless a number are joined together in a comparatively large mass, which might constitute a small speck of dust. Wherever decomposing matter is allowed to become dry and disintegrated, the air is constantly receiving a contribution of these agents of disease and death. Animal or vegetable matter thrown out on the surface of the ground, is likely to become a source of germs. Such places as vaults, cesspools, surface drains, gutters, heaps of decaying wood or staple refuse, pigpens, chicken coops, the borders of stagnant pools, or any mass of decomposable matter, may constitute a source of germs. In dwellings, the most prolific sources of germs are sinks, neglected cellars and pantries, carpets filled with dust, feather beds, neglected closets, and not infrequently a close, damp, unventilated space under the house, into which small animals creep to die, or in which rank vegetation develops, only to die and decompose.

Persons suffering from contagious or infectious maladies are generally sources of air contamination. Erysipelas, diphtheria, typhoid fever, smallpox, scarlet fever, measles, whooping cough, consumption and similar maladies, constantly give off dangerous germs into the surrounding air.

How to Combat Germs.—Cleanliness is the best of all means for combating germs. A house that is thoroughly cleaned will be free from germs, unless they are produced in prolific numbers in the immediate vicinity, and are brought in through open doors and windows. No decomposable matter, whether animal or vegetable, should be allowed about the premises occupied by human beings. It is a mistake to suppose that decomposable matter is safe if buried in the ground. Germs will still be given off, and the air as well as the soil will be contaminated.

Substances capable of destroying germs are known as germicides, or disinfectants. There are many substances capable of destroying germs, but we shall mention only a few of the most serviceable.

Corrosive Sublimate.—The most efficient of all known germicides which are available for ordinary use, is corrosive sublimate, a chemical agent often employed by housewives in the destruction of certain kinds of vermin. Most germs are killed by the application of a solution of one part of corrosive sublimate in four thousand parts of water. Even weaker solutions are effective for the destruction of certain kinds of germs. A strong solution, however, is needed for the certain destruction of some germs which are very tenacious of life. The 1-2000 solution of corrosive sublimate is made by the addition of one half dram of corrosive sublimate to a gallon of water. A solution of this powerful poison should never be kept on hand, owing to the danger of fatal accident, especially in homes where children or ignorant persons are likely to come in contact with it. It is better to have a number of half-dram powders put up at a drug store ready for use when needed.

If a solution must be kept ready for use during the care of a case of typhoid fever, it should be tinged with some coloring matter, as cochineal, which will serve as a warning against its use, and the jug or bottle containing it should be labeled "Poison," and should be kept carefully out of the reach of persons likely to be harmed. The nature of this chemical agent is such that it cannot be kept in a metal vessel. If placed in tin vessels, the tin coating is quickly destroyed, hence such solutions must be kept in glass or earthen-ware vessels.

Sulphurous Acid.—The fumes of burning sulphur, which, when combined with water, form a chemical substance known as sulphurous acid, constitute one of the most useful means of destroying germs in the air, and are especially useful for the disinfection of rooms which have been occupied by persons suffering from contagious or infectious maladies. Sulphur is also useful as a means of destroying the germs which, growing in cellars, pantries, closets, and damp places, give rise to the peculiar musty odor characteristic of such places. The following is the proper method of using sulphur for this purpose: Place in an iron kettle, equal parts of sulphur and powdered charcoal, mixing a few pieces of newspaper with the powder. The quantity required is four pounds of sulphur for each one thousand cubic feet of air in the space to be disinfected. Place two or three bricks in a wooden tub containing an inch or two of water. Place the kettle upon the bricks, and after tightly closing the windows and stopping the cracks by pasting paper over them, light the mixture, and when it is well going, leave the room, close the door tightly, and paste strong paper over the cracks so as to confine the fumes within the room. After twenty-four hours, open the doors and windows, and allow air to circulate freely through the room for a day or two. The walls and floor should then be thoroughly scrubbed, and the room can be considered well disinfected.

Turpentine.—This commercial agent is also an excellent disinfectant. It may be used for disinfecting discharges, in the absence of other efficient agents. It should be remembered, however, that it is very inflammable. It is necesary to employ a quantity of turpentine equal to the volume of matter to be disinfected.

Alcohol.—This common agent is an excellent disinfectant. To be effective, however, it must be undiluted. Poor spirit alone will not answer for this purpose; ninety-five per cent alcohol is required. A quantity of alcohol, at least equal to the amount of poisonous matter to be destroyed, is needed for effective disinfection. Alcohol is, of course, too costly an agent to be employed for the disinfecting of clothing or discharges, except in extraordinary cases, but is very useful as a means of disinfecting the hands or other portions of the body.

Dry Heat.—A temperature of 300 degrees is destructive to nearly all germs. Unfortunately, however, this temperature, when maintained for a sufficient lenth of time to render certain the destruction of all germs, is likely to seriously damage the texture of many fabrics, hence this mode of disinfection is not in very great favor. It may be employed, however, for the disinfection of many objects which cannot be safely exposed to the action of chemical agents or water. Objects requiring disinfection by this mode may be placed in an oven, care being taken to place a bit of dried bread or a piece of white paper in the oven with them, by watching which, the degree of heat and liability to injury may be determined.

Boiling.—This is one of the most convenient of all modes of disinfection, since it is always ready to hand, and can be employed at little or no expense. Nearly all germs are killed by boiling for from thirty minutes to one hour. All germs dangerous to life, or so-called disease germs, may be readily destroyed in this manner.

Most germs are killed by boiling for from fifteen to thirty minutes but boiling for from fifteen minutes to an hour is the safer plan. It should be remembered that boiling water is not a disinfectant. Heat in connection with moisture is the disinfectant agent, consequently it is necessary that a boiling temperature, which is ordinarily something less than 212 degrees, should be maintained for the time mentioned, to insure thorough disinfection.

VENTILATION AND WALLS.

We are becoming more and more convinced, says the *Weiner Bauindustri Zeitung*, that the pernicious effect upon health of humid dwellings is chiefly due to the fact that the moisture arrests the circulation of the air. Professor Max Von Pettenkofer, the father of modern hygiene, has shown that, as regards the ventilation of dwellings, walls play a more important role than the opening of windows. As, however, our dwellings, par excellence, have for their purpose to protect us against climatic vicissitudes, it might be assumed that the porousness of the walls might counteract this object. This is, however, not the case; on the contrary, porous building materials are the best protection against rapid changes of temperature. As is generally known, the air is a very bad conductor of heat—i.e., it absorbs heat very slowly and discharges it equally slowly. The more porous the building materials the larger is the volume of air they are capable of containing, and whilst the pores do service as ventilators, the air enclosed in them acts as a regulator of heat.

It is only of late that we have commenced when building new houses to make special arrangements for ventilation. The best of these hail from England, where generally great stress is laid upon a good ventilation. On arranging ventilating apparatus it is not sufficient to provide fairly wide canals for the ingress and egress of air; but certain settled mathematic-physical laws have to be considered. Pre-eminently it is important to prevent the generation of draught, and, at the same time, not arrest a strong exchange of air, for which reasons it is particularly advisable to connect the ventilating apparatus with the fire-place.

On building a house it is most advisable, as is the custom in England, to make the canals for the escape of the air of zinc sheeting and run them up to the roof, close to a chimney or, better still, between two chimneys. The escaping air becomes, through this arrangement, slightly warmed on ascending, and escapes the quicker. One may also install an air syphon pipe, leading from the upper part of the room to the floor, and finishing behind the fireplace. However, this apparatus only acts when there is a fire.

Of special importance is the manner in which the fresh air is let into a room. If it be effected from below, it is advisable to conduct the air coming from without under the floor to the fireplace, so that on entering the room it is warmed. With this arrangement the advantage is combined that the occupants of a room are not exposed to draught and that, even when seated close to the fireplace, no closeness is felt from the heat emanating therefrom. A pleasant fresh warmth is diffused throughout the room. If the situation of the latter or that of the fireplace should not admit of such an arrangement, the fresh air may be made to enter about half-way up the wall, which is simplest effected through a pipe In heating with steam or water this arrangement is in particular to be recommended, and, in order to prevent in this case the unpleasantness of a cold current of air, the heat-conducting pipes should be so arranged that the air already on entering the room is warmed, and cannot therefore create any downward currents.

In England, as is generally known, sliding windows are used in which the upper half may be drawn down a couple of centimetres, but still draught be prevented by a list, or border, whilst fresh air may be let in by similarly opening the lower half. However, this arrangement is unsuitable in countries where there is generally a greater difference of temperature of the air within and the air without than in that country, as it generates a most unpleasant draught.

Fresh air may also be introduced into dwellings by mechanical agencies—viz., by the so-called impulsors. The pure air is derived somewhere near the house and conveyed to the ventilator, which diffuses it through canals into every corner of a room. The impure air escapes through fissures and openings in windows, doors, walls, and ceilings. And if in addition a corresponding system of suoctin canals be arranged, the effect is the greater, and the division of air is under complete control. Indeed, in certain circumstances, dust may be carried away with the vitiated air. The circulation of air is affected by the fresh air entering at the top of the room and sinking downwards, whilst the impure air, together with any falling dust, is sucked out at the bottom under the floor.

But for the ventilation of factories and workshops arrangements of a different kind are required. In such cases the main point is that in the cold season the fresh air enters the workrooms warmed, and that the vitiated air continually escapes. Solitary apertures conveying cold air into the room cause draught and discomfort, and are therefore generally stopped up by the work hands. However, the conveyance of fresh air into such shops may be easiest effected by running a fairly wide canal under the floor, carrying the air from without to the fireplace, which should be encircled with a mantle of sheet iron, extending to the floor. The mouth of the air canal is situated in the space between the fireplace and the mantle. Thus the air on entering becomes warmed by the fire, and escapes at the upper end. Larger workshops require, of course, several fireplaces, and each one should have such a canal.

The ejectment of the vitiated air is effected by the fire and the chimney. In order to effect this better, square brick-built chimneys are to be preferred to the ordinary grates, and of greater width. In this an iron pipe is fixed in such a manner that there is a space between it and the brick chimney. The iron pipe serves to carry off the smoke from the fire, whilst the impure air escapes through the intervening space. For this purpose a sufficiently wide aperture in the brick chimney is made near the floor, and another opening may be made near the ceiling for ventilation in the summer. Both apertures may be closed with valves.

FOR THE DIGESTION.

Customer—"Your 10-cent shine isn't as good as your 5-cent one." Bootblack—"I know it, sir; that's the reason I charge more. They injure my reputation."—*Puck.*

The Reason—Peeler (before doors of wrecked bank)—"What are you loafers collecting here for?" The Peeled (in chorus)—"Because we can't collect inside."—*N. Y. Sun.*

There is no solitude so miserable as that of the man alone in a noisy city, unless it be that of a man alone with a noisy baby.—*Elmira Gazette.*

The bacillus of baldness has been discovered in Germany. It only remains to prove that it is of the female persuasion, and never found single.—*Philadelphia Times.*

"My social instincts are always very strong," said the policeman. "It gives me intense satisfaction to meet some good clubable fellow."—*Washington Post.*

"In practicing the banjo," writes a teacher, "don't get discouraged." That's wise. You can safely leave that for the persons who have to listen to you.—*New York Recorder.*

Mrs. Schoeffenstedt—"Tonight's paper tells about a minister who has married more than 1,300 couples." Mr. Schoeffenstedt—"I wonder if he ever stops to think."—*Somerville Journal.*

Wool—"Old Scroggs seems to want to get all he can for his money." Van Pelt—"Dosen't he? Why, that man wouldn't take an ounce of prevention if he could get a pound of cure at the same price."—*New York Herald.*

He"—Life with me has been a failure." She—"You must have had and wasted some opportunity." He—"No; I have spent half my life raising whiskers to conceal my youth, and the other half dyeing them to conceal my age."—*Munsey's Weekly.*

Fond grandmother—"Understand Spanish? Speak French and German? What a talented little lady you are, to be sure?"

The little lady (grandly—"Yes; and my governess says that after awhile I may speak English correctly."—*Puck.*

When his physician advised him to "take a walk upon an empty stomach," Sidney Smith asked, "Upon whose?" which reminds one of Capt. Tom Sheridan's question to his father when the latter advised him to take a wife—"I am perfectly willing to do so, but whose wife shall I take?"

He slipped quietly in at the door, but, catching sight of an inquiring face over the stair rail, said: "Sorry so late, my dear! couldn't get a car before." "So the cars are full, too," said the lady; and further remarks were unnecessary.

Mrs. A.—"I heard something about you the other day." Mrs. B.—"Is it bad enough to repeat?"

A Williamsport girl, who in the matter of beauty and affectionate exuberance was not to say "fresh as first love and rosy as the dawn," was asked why she did not get married, and this is what she said in reply: "I have considerable money of my own, I have a parrot that can swear, and a monkey that chews tobacco, so that I have no need of a husband."

PLUMBING NOTES.

The *Sanitary Plumber* says: The Plumbers' Bill at Albany failed to pass. As was the case last year, it was left to somebody to look after, and they failed to give it attention until near the close of the session. Then came the "deadlock," and the plumbers, in spite of the hasty dispatch of a committee of New York and Brooklyn craftsmen to the capitol, were "left." It is of no use, gentlemen. You must be on hand early and *always*—often is not good enough—or like the man who drove the hearse, you will not be in it.

R. S. Kirtley, Secretary of the Kansas City Master Plumbers' Association, kindly sends us the following list of delegates elected from that association to the Cincinnati convention: L. B. Cross, president, D. M. Quay, J. L. Ryle, Thomas Farley. Alternates, R. B. Farley, James Bewsher, Dent Yates.

Plumbing Inspector Wilson, of Buffalo, N. Y., has been relieving the monotony of some of the indifferent workmen and making things a little more lively for them. The Board of Health promises to bring the offenders to time.

When you want your plumbing done,
Get a plumber.
When you want a doctor's dun,
Get a bummer.

About as handsomely gotten up catalogue as we have seen comes from Peck Bros. & Co., 259 Wabash avenue. The increased demand for lavatories and the requests often made by their customers for illustrations of the same, they have, by this publication, anticipated the issuance of a complete catalogue of this line of goods. The catalogue illustrates Peck's Improved Lavatories from No. 1 to No. 7 inclusive, showing each adjusted for use. The cuts make handsome pictures, and we have no doubt that the lavatories will make as handsome fixtures.

The mayor of Denver is desirous of having the inspector of plumbing made one of the officers of the health bureau. The city engineer is also in favor of having the plumbing inspector connected with the health department. If he is a practical plumber, he will do good wherever he is put; if he is not, he will be out of place wherever he is put.

There was a little tinker
And he thought that he could plumb,
So he tackled once a contract
And tussled with it some.
The inspector was a plumber
And on the tinker sat,
And had him fined a fifty
Ere he knew what he was at.

New Haven, Conn., will probably have a new plumbing ordinance soon. Alderman Clerkin, Secretary of the Master Plumbers' Association of that city, has been given a hearing before the Committee on Ordinances on behalf of a plumbing ordinance, and made a good impression. The ordinance provides that plumbers shall be properly licensed, and gives specific specifications for house plumbing. It has been favorably recommended to the council.

On the 26th of this month the annual convention of the National Association of Master Steam and Hot Water Fitters opens at Philadelphia. The main question for consideration will be the formulation of a schedule of prices on supplies that will give a profit to dealers and mechanics.

The employes of Stillwell, Bierce & Co., of Dayton, O., are going to have a big picnic on the 29th of this month, and have already made extensive preparation. Among the attractions, they will have a match game of base ball for a $15 cash prize, a boat race for a new suit of clothes, foot races, mule races and other contests for prizes. The picnic will take place at Woodsdale and it is expected that it will be a big thing.

We have seen an article some place discussing the danger in sewers, and protesting against the construction of them. If the danger is in the sewers it will harm no one as long as it is kept there. There is the place for it, and there is just where good plumbing will keep it. The proper thing to do is to construct good sewers and confine all the dangers to health in them. The cesspool, the privy vault and yards and houses are not the places for disease germs and poisonous gases.

Stingy Peter wanted plumbing
In his dwelling house put in;
And he hustled for a tinner,
Hustled like the very sin.
He found at length a tinner ready
To put the job of plumbing in;
And the microbes now are happy,
For they straightway crawled within.

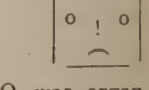
A display at the World's Fair showing the advancement in plumbing for the last ten years would surprise even the plumbers themselves, and awaken a new interest in the public regarding this important adjunct of healthful homes.

It is reported that Mr. Henry Hudson will be appointed Plumbing Inspector at Indianapolis, Ind. Mr. Hudson is a practical man, and we have no doubt that he would be the right man in the right place. He understands the business, and under his direction, the sanitary conditions of Indianapolis homes would be improved.

An exchange puts it this way:

The plumber who cut prices
And did a rushing trade,
Thought he saw prosperity
And had his fortune made.
And he
smiled
like
this:

But when he balanced up his books
And found just where he stood,
He quickly changed his methods—
None to soon for his own good.
But he
smiled
like
this:



A Master Plumbers' Association of Mansfield, O., was organized May 1, by electing the following officers: J. J. Tait, president; Geo. Schissler, vice president; Geo. S. Harris, treasurer; Wm. M. Harris, secretary. The members of the association are J. J. Tait, Geo. Schissler, Geo. Harris & Son. The association is organized for sanitary, commercial and social purposes, and has for its special object the advancement of the trade in all the latest discoveries of science appertaining to sanitary laws; to promote and combine the intelligence and influence of members for the protection of the trade against imposition, injustice or encroachments upon common rights.

Through the kindness of Mr. William Harkness, Treasurer of the Philadelphia Master Plumbers' Association, we are enabled to give the list of delegates elected by that association to the National Association: John E. Eyanson, President, John J. Weaver, Wm. Harkness, Wm. M. Wright, Wm. McCoach, Geo. F. Uber, F. P. Brown, W. H. Doyle.

The first question asked an applicant for the position of plumbing inspector should be: "Are you a practical plumber; do you understand the business?" If the answer is "no," that should settle the case with him. If the answer is "yes," then he should be nvestigated as to other qualifications.

The *Sanitary Plumber* takes this view of the case: Andrew Young, who has done so much as Chief Inspector of the Health Department of Chicago, for the welfare of the Western metropolis, and who was the first health officer to make any perceptible headway against the smoke nuisance, has been dropped on account of political changes. Just at this time, when it will take an energetic and thoroughly capable official all the time that will elapse before the World's Fair opens to get the city into a presentable condition for the influx of visitors expected, Mr. Young's retirement is particularly unfortunate; but the victor claims the spoils.

"I'm feeling pretty well, I thank you,"
Said the microbe to the fever;
"They have no plumbing regulations
And I've the long end of the lever.

Come with me and I will show you
How the people germs are quaffing,
How the tinners all are prospering,
How the doctors all are laughing."
And the fever followed after,
Through the homes throughout the summer;
And the doctors and the tinners
Mocked and scoffed the honest plumber.

We often receive letters making enquiries about a plumbers' estimate book. All wishing information regarding this book can obtain it by addressing William Vanderman, Willimantic, Conn., whose advertisement appears in another part of this paper.

Any one understanding the importance of good plumbing will not employ an incompetent workman. The thing necessary now is the education of the public up to a proper understanding of what good plumbing is and its value to health.

WHERE PLUMBING WORK IS BEING DONE.

Adams and Francisco streets, O. H. Fostal; Augusta cor. Richmond, Miller; Arher, west of Rockwell, Geo. Nerz; 5045 Atlantic, James Evans; 4814 Atlantic, J. Teutsch; Byrne ave. south of Belmont, Garner & Bahn; California ave and Twentieth; C. Kostlevy; Clark and Centre, Wm. Bletch; Clarence north of Nellie, Wm. Bletch; 6971 Clifton ave., Gay & Culloton, Clark and School, A. Keeley; 5201 Dearborn, P. Schmidt; 3506 Dearborn, John Deegan; 2704 Dearborn, Wm. Bowden; Duncan Park and School, F. N. Kuhn; Emerald ave. Chas. Kostlevy; 773-412 Eighteenth, Chas. Kostlevy; 16 Evans Court, Love & Labold; 811 Eighteenth, Chas. Kostlevy; 1577 Fillmore, H. Smith; Forty-sixth and Wentworth, F. N. Kuhn; 137 Fifty-fifth, P. Schmidt; 1565 Fillmore, H. Schmidt; 152 Fowler, Frank Falk, Fifty-ninth near Winter, J. H. Killian; 3203 Fifth ave, J. Teutsch. 606 Fourteenth, Chas. Walter; Fullerton and South Port, J. Peters; 42 Fowler, Miller; 57 Frankfort, Harvey & Mose; 2839 Fifth ave; J. Teutsch; 945-47-49-51 Fairfield ave., Harvey & Mose; Fleetwood near North ave., E. Sheehan; Fulton bet. Kinzie and Homan, D. T. Shay; Fullerton cor. Osgood, Gay & Culloton; 24 Goethe Court, J. J. Geiss; Hoyne ave. near Jane, Wm. Herbst; 1150 Halsted, W. Herbst; 47 Heine, T. W. Page; Homan ave and Carroll, G. Meuller; Homan and Chicago, S. Smith; 591 Hoyne ave. Harvey & Mose; 782 Herndon, Wm. Bletch; 177 Illinois, E. Sheehan; Irving ave., S. Deutcher; 3351 Indiana ave., A. A. Campbell; 523 Lincoln north, W. Muller; Leavitt and Parmelee, John Watson; 235 Maxwell, Chas. Kostlevy; 41 Menomi, nee, R. Powers; 161 Milton ave., J. Sullivan; 159 Mozart, M. Page; 1097 Milwaukee ave., Gruschow; 639 Morris, J. Hardin; 850-854 Melrose, Wm. Bletch; 3665 Michigan, A. Keeley; 512 Normal Park, D. F. Dewar; 637-39 Noble ave., P. Feltman, Oakdale and E. E. R. T., P. Feltman; 246 Ohio, Hamblin Co.; 24 Oakley ave., W. C. Brown; 60 Olga, W. Bletch; 5041 Prairie ave., R. Powers; Polk East of California, Chas. Kostlevy; 1371 Polk, A. H. Rastman; 86 Park N ave., Harvey & Mose; 265 Paulina, A. Cameron; 3033 Portland ave., J. Teutsch; Paulina and Thirty-seventh, Chas. Kostlevy; 402 Robey, Nelson & Ceelhoffen; 58 Racine ave., J. Sullivan; 810 Rockwell, Harvey & Mose; 104 Samuel, Glen; 5313 School, Wm. Metz; 3812 Stanton ave., J. Sullivan; 44 Sherman, P. Schmid; Superior and Wells, H. S. Thompson; School and Fiftieth, P. K. Hardin; 1236 Sheridan ave., Garner & Bahn; Sheridan south of Belmont, Garner & Bahn; 688 Seymour, Harvey & Mose; 2926 Shields ave., Wm. Bowden; 989 Southport, J. N. Dewald; 946 Thirty-seventh, G. Metz; 348 Troy, Smith; 43 Tell Court, J. Dennison; 131 Twenty-fourth Place, G. Merz; Thirty-fifth and Wallace, F. N. Kuhn; 1789 Thirty-fifth, Coller & Son; 7-13 University Place, Simons & Son; Ullman and Thirty-first, John Teutsch; 474 Union, Chas. Waters; 5115-16 Wentworth ave., P. Schmidt; Woodlawn ave., D. T. Dewar; 451 Warren ave., Love & Labold; 169 Water, Roser! 4090 Wentworth ave., A. Miller.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

New York City, N. Y.: Renwick, Aspinwall & Russell have designed for Miss C. Roache a 5-story flat and store, 24.8x96, to be built on the northeast corner of Third avenue and Twenty-eighth street. Charles H. Israels has designed for Ascher Weinstein a 6-story brick, iron and stone store and factory building, 38x25, to be built at No. 81 Suffolk street. Henry Davidson has designed for J. B. Cannon a 5-story flat and store, 30x92.11, to be built on the southwest corner of Park avenue and One Hundred and Fourteenth street. Wm. Shickel & Co. are the architects for the 8-story brick and stone addition, 75x103, which R. H. Macy & Co. will have built on the north side of Thirteenth street, 125 feet east of Sixth avenue.——Chicago, Ill.: H. B. Wheelock has planned for Vickery Bros. a 6-story apartment house, 25x140, to be built at Wabash avenue and Twelfth street; cost, $40,000 Also for Mr. Gordon a 3-story residence, 32x62, to be built on Grand boulevard near Forty-sixth street; cost, $10,000. Beers, Clay & Dutton are preparing plans for four 3-story dwellings for Mr. H. H. Belding, to be erected on Bryant near Vincennes avenue; cost, $35,000. They are also completing plans for the Seymour school to be built at Blue Island; cost, $35,000. Also for B. F. Dodson a 2-story and attic residence at Geneva, Ill.; cost, $18,000. Robert Rae, Jr., has planned a 6-story store and flat building, 50x125, to be built on Wabash avenue near Fourteenth street, by J. A. Coleman; cost, $50,000. Also for M. L. Swift he has planned four 4-story dwellings, 70x75, to be erected on Berkeley avenue and Forty-fifth street; cost, $60,000. Also for James Ingram a 3-story flat building, 50x115, to be built on Wentworth avenue and Seventy-second street. Stone, pressed brick and terra cotta interior; cost, $60,000. Also for Albert Thocker a 3-story residence, 27½x75, to be built at Drexel boulevard and Forty-first street; cost, $15,000. For George Buchanan he has planned two 3-story stone front residences to be built on Calumet avenue near Forty-third street; cost, $15,000; Also two adjoining these for J. A. Coleman to cost $15,000. For William Wilson a 3-story, 28x52, to be built on Woodlawn avenue; cost, $8,000. For Henry Babcock a 2-story and cellar residence, to be erected at Hinsdale, Ill.; cost, $8,000. For Thomas Boyd, two 3-story residences to be built on Woodlawn avenue near Forty-fifth street; cost, $15,000. Also a $6,000 residence for Frank Boyd, to be built at Auburn Park. Also for Charles F. Otis two 3-story dwellings to be built at Sidney avenue and Forty-fifth street; cost, $15,000. E. H. Turnock is preparing plans for a 6-story apartment house, 130x100, to be built at the southwest corner of Indiana avenue and Twenty-sixth street, by J. A. Campbell and others; cost, $125,000. Ostling Bros. have planned a 3-story store and flat building, 44x69, to be erected at Waukegan, Ill., by W. H. Mohrmann; cost, $15,000. Flanders & Zimmermann have planned a 3-story flat building, 22x60, for J. W. Ott, to be built at 182 Warren avenue; cost, $7,000. They have also planned a new front and alterations on the building at 308 State street for J. V. Calkins. Fred. W. Perkins is preparing plans for converting the three dwellings at 1301, 1303 and 1261 Michigan avenue into store and flat buildings for B. Philpot & Co.; cost, $30,000. J. E. O. Pridmore has designed a 4-story store, office and flat building to be built at Forty-third street and Evans avenue; cost, $50,000. Ruehl & Hildinger have planned a 3-story and basement factory for M. Goldberg, to be built at Wilson and Clinton streets. Brick and stone construction; cost, $10,000.——Brooklyn, N. Y.: Franklin street, Nos. 219-225, four 4-story brick dwellings, 25x61; total cost $30,000; owners, Rentz & Hulthouser; architect, C. Dunkchase. Nostrand avenue, northeast corner Dean street, five 3-story brick

dwellings, 20x100; total cost, $62,500; owner, Andrew Miller; architect, H. Olmsted. Manhattan avenue, west side, 250 feet south of Meserole street, three 5-story brick tenements, 25x100; total cost, $21,000; owners, Randall & Miller; architect, owners. Montague street, southwest corner Clinton, 10-story basement and attic brick bank and office building, 50x92; cost, $200,000; owners, Franklin Trust Company; architect, George L. Morse. North Henry street between Herbert and Monitor, 1-story brick church and chapel, 88x164; also rectory, 23x27; total cost, $120,000; owner, E. J. McGolrick; architect, T. H. Poole.——St. Louis, Mo.: North side of Fairfax, between Vandeventer avenue and Sarah street, 2-story brick dwelling, 42x42; cost, $5,600; owner, T. Dunn. Northeast corner Belle avenue and Sarah street, 2-story brick store, 20x72; cost, $5,000; owner, D. A. Cooper. Southwest corner Lami and Twelfth streets, 2-story brick dwelling, 22x68.8; cost, $7,000; owner, W. Grohl. Northeast corner Broadway and Victor street, 3-story brick dwelling and store, 29x86; cost, $7,500; owner, M. Guffreman. South side of Lindell avenue between Cabanne street and Vendeventer avenue, 2-story brick dwelling, 34.6x72; cost, $25,000; owner, Archepiscopal Committee. South side Washington avenue between Vandeventer avenue and Sarah street, 3-story brick dwelling, 28x36; cost, $6,000; owner, J. Maxwell. North side Bell avenue between Newstead and Taylor avenues, 3-story brick dwelling; cost, $6,000; owner, G. Peisch. Twenty-first street and Cass avenue, 4-story brick warehouse, 90x40; cost, $7,000; owners, Weber Molding Co. South side of Hawthorne street between Arkansas and Grand avenues, 2-story brick dwelllng, 43x63; cost, $10,400; owner, G. J. Woerner. North side of Bartine avenue between Union and Florence avenues, 2-story brick dwelling, 32x73; cost, $11,000; owner, E. A. De Wolf. East side of Bacon street between Magazine and North Market streets, 2-story brick dwelling, 30x60; cost, $7,000; owner, J. M. Jordan.——Pittsburg, Pa.: The Braddock School Board is contemplating the erection of a new school house. Architect James N. Campbell has plans for a school house at Clayville, Pa. Estimated cost, $25,000.——Washington, D. C.: Architect N. T. Haller is preparing plans for the erection of two 3-story and basement houses for Mr. Thomas W. Kerr. They will be located on R street, east of New Hampshire avenue northwest. One will be 19x46, and the other 31x36. The cost will be about $15,000. The Washington and Georgetown Railroad Company has taken out a permit for the erection of the new power house on the square bounded by Thirteenth-and-a-half and Fourteenth and D and E streets. The cost is placed at $500,000. Architect James F. Denson has made plans for a dwelling that Dr. H. D. Fry will have built on Fourteenth street between Massachusetts avenue and L street at a cost of $10,000. It will be four stories and cellar. Jonas, Gibbs & Co. have plans and closed contract to build a hotel at University Heights, on the site of old Fort Bunker. It will be a 3-story frame structure, with a frontage of 170 feet by an average depth of 50 feet; cost between $75,000 and $100,000. An apartment house is to be built at the northwest corner of New Hampshire and Oregon avenues, by Dr. J. M. Gregory and others. It is proposed to erect a building five stories and basement, 50x110. It will have front of buff brick and Indian limestone; cost between $50,000 and $75,000. The Harvey Estate will build three 2-story brick stores on Tenth street, between D and E streets northwest, opposite the gas office. Architect Jos. C. Johnson has made plans for a residence that Harry Johnston will have built on Linden street, Le Droit Park. It will be three stories and basement, 22x60, with front of press brick and brown stone; cost, $8,000. S. J. Meeks will build a carriage repository on the south side of G street, between Sixth and Seventh streets northwest. The plans were made by Architect J. G. Myers. Architect J. G. Myers has plans for a handsome residence that Col. Jno. T. Gibson will have built at Charlestown, W. Va. It will be three stories, basement and attic, 65x45. Architect A. B. Bibb has plans for a dwelling that R. H. Goldsborough will have built at Tunlaw Heights. It will be of stone and wood, 91x63, three stories high. Jno. S. Larcombe is the builder.——South Bend, Ind.: Architect R. L. Braunsdorf is working upon plans for a residence for Frederick S. Fish, of Newark, N. J.; cost not less than $25,000.——Anniston, Ala.: The Board of Education has recommended the location of two additional white schools and one colored.——Buffalo, N. Y.: C. K. Porter & Son have plans for a $50,000 edifice for the Richmond Ave. M. E. Society, on Richmond avenue and Terry street. A chapel will also be erected.——Dallas, Tex.: Eakins Bros. will build a $16,000 3-story brick building. Geo. V. Hughes will erect a 2-story brick building at a cost of $10,000. The Security Mortgage and Trust Co. will erect a large building at the corner of Main and Austin streets.——Detroit, Mich.: The German Lutheran Bethel Society will erect a $7,000 church edifice. Spier & Rohns are the architects. Gordon W. Lloyd has plans for a $50,000 addition to St. Mary's hospital.——Stillwater, Minn.: Douds Sons & Co. will rebuild their barrel factory destroyed by fire.——Arkansas City, Kan.: Congress having appropriated $60,000 for improvements at the Chillocco, Indian schools south of this city, a new girl's dormitary, a dining hall and other buildings will be erected during the present year. Plans are now being prepared.——Canton, Ohio: Two additional school houses will be erected.——Denver, Colo.: J. W. Roberts has plans for a stone dwelling to be erected at the corner of Corona street and Eleventh avenue at a cost of $20,000. The St. James M. E. Church will erect a $20,000 building; architects, Kidder & Humphreys.——Fort Worth, Texas: The Methodist Polytechnic College is to be erected at once.

HEATING AND LIGHTING.

New electric light plants or extensions are reported as probable in Central Falls, R. I.; Colorado, Tex., address the Colorado Electric Light Co.; Union City, Tenn.; Mt. Airy, N. C., address the Granite City Land & Improvement Co.; Jackson, Tenn., Gallup, N. Mex., address W. F. Reichenbecker; Covington, Ky., address E. F. Abbott; Anniston, Ala., address the Anniston Gas & Light Co.: Uvalde, Tex.; Mineola, Tex.; Palatka, Fla.; Caribou, Me., address the Caribou Water Co.; Dundee, Ill., address J. G. Irick. The following new electric light companies have been incorporated: Hagerstown Heat & Light Co., Hagerstown Md.; capital stock, $35,000; incorporators, E. W. Mealey, C. F. Manning, W. L. Hammond, of Philadelphia. Carbondale Electric Co., Carbondale, Ill.; capital stock, $5,000; incorporators, R. D. Bradberry, G. W. Graham, W. A. Schwartz. Waterford (N. Y.) Electric Light & Power Co.; capital stock, $30,000. Rogers Park (Ill.) Light, Heat & Power Co.; capital stock, $75,000; icorporators H. E. Keeler, N. A. Partridge, G. W. Wilbar. Put-in-Bay; (O.) Electric Co.; capital stock, $50.000; incorporators, G. H. Ketchum, N. H. Swayne, J. H. Doyle.——Watkins, N. Y.: The electric light company has purchased a new building and will greatly extend its plant.——Anniston, Ala.: The Anniston Gas and Light Company will double the capacity of its present electric light plant.——Harvey, Ill.: H. H. Badger and others are about to establish an electric lighting plant at this place.——Central Falls, R. I.: The question of establishing an electric lighting plant is being mildly agitated.——Maysville, Ky.: J. M. Frazee and others contemplate the erection of a gas plant.

SEWERAGE NOTES.

Bath, Me.: An appropriation for sewers has been made.——Augusta, Me.: Agitation in favor of a sewerage system has been started.——Laconia, N. H.: It has been voted to establish a system of sewerage at a cost of $100,000.——Middleboro, Mass.: An appropriation of $20,000 has been made to commence its sewerage system.——Quincy, Mass.: The city will construct a system of sewers.——Glens Falls, N. Y.: Mr. S. E. Babcock, of Little Falls, has been engaged to plan a system of sewers.——Rome, N. Y.: It is proposed to bond the city to build sewers.——Bridgeton, N, J.: Plans have been submitted for a system.——Kittanning, Pa.: A sewerage system is contemplated.- —Roanoke, Va.: $150,000 has been appropriated for sewers.——Greenville, S. C.: It is proposed to establish a sewerage system at a cost of about $20,000.——Weston, O.: Sewers are to be built. —Belleville, Ill.: Plans and estimates for sewerage will be prepared upon the recommendation of the mayor.——Newhatcom, Wash.: The question of spending $25,000 for sewers is being discussed. ——Boise, Idaho: Bonds for $50,000 for a sewerage system will be issued.——Fairhaven, Wash.: Considerable additional work on the sewer system is contemplated for the near future.——Greeley, Colo.: The city has voted $10,000 for a drain sewer. E. F. Dawley is city clerk.——Tacoma, Wash.: Many additional sewers will be built.——Grand Forks, N. Dak.: The sewer question is again being discussed.

WATER WORKS NOTES.

Concord, N. H.: A new supply from Penacook Lake has been recommended. The plan includes a pumping station and distributing reservoir, and the estimated cost of the improvements is $215,000,——Lancaster, N. H.: A new water works company was organized May 21, with a capital of $40,000——Bradford, Vt.:

Works are proposed by a new company.——Woonsocket, R. I.: The Water Committee of the Council has recommended the appropriation of $40,000 for water works improvements.——Wallingford, Conn.: A meeting is to be held to vote $50,000 for a new supply main, 16, 14 and 12 inches in diameter, as recommended by Engineer T. H. McKenzie, Southington.——Rochester, N. Y.: An extension of the mains to East Rochester is under consideration.——Middleton, N. Y.: The proposed new mains include 10,000 feet of 20, and about 5,700 feet of 12-inch pipe.——New Paltz, N. Y.: W. H. Cowan, of Stamford, and others, propose to build works here. It is said that a gravity supply including a 1,000,000 gallon reservior, an 8-inch supply main and 25 hydrants is projected.——Hughesville, Pa.: The people have voted in favor of water works.——Lancaster, Pa.: C. B. Brush, Hoboken, N. J., has recommended that the new 15,000,000 gallon reservoir be located on high ground in the west part of the city, near the Franklin and Marshall College. The sum of $150,000 has already been voted for the reservoir.——Frederick, Md.: A 20,000,000 gallon storage reservoir is proposed.——Fairmount, W. Va.: A system of water works will be constructed at a cost of $20,000.——Atlanta, Ga.: The Water Commissioners have reported to the City Council in favor of a new supply from the Chattahoochee River in accordance with the plans of Rudolph Hering of New York. The plan includes a pumping station at the river with a 4,000,000 and 6,500,000 gallon pumping engine; a 30-inch force main, 18,500 feet long, rising 258 feet; a 35,000,000 gallon clear water basin at the upper end of the force main; a re-pumping station at the clear water basin with a 4,000,000 and two 6,500,000 gallon pumping engines; a second 30-inch force main, 14,480 feet long, rising 322 feet; and additional filters with a daily capacity of 6,500,000 gallons. The total estimated cost is $792,000. At latest reports the Commissioners recommendation had not come before the City Council.——Marion, Ala.: Works are proposed.——Cleveland, Ohio.: It is proposed to extend the present water tunnel to a distance 3¾ miles from shore. The estimated cost is $750,000.——Findlay, Ohio: It is reported that the city will build new works.——Danville, Ill.: The Stony Creek Water Co., has been incorporated by Louis Platt and DeWitt C. Frasier, to supply Danville and Germantown; capital, $200,000.——Dundee, Ill.: J. G. Irish, clerk, can furnish particulars regarding proposed water works. Twenty-five hydrants will be required.——Kenosha, Wis.: An artesian well and one mile of mains will be added to the present system.——Springfield, Ill.: The Water Board is considering a new 24-inch main from the river to the city; estimated cost, $55,000.——Sioux City, Ia.: Another reservoir is projected.——Luverne, Minn.: Bonds for works to the amount of $30,000 have been voted.——Butte City, Mont.: The Butte City Water Co., will construct a magnificent system of water works. Chester B. Davis, of Chicago, is consulting, and Ray & Leonard of Butte City are contracting engineers.——Prescott, Ark.: The Council is considering works.——Crockett, Tex.: Works are talked of.——Martinez, Cal.: The Water Works Company proposes to add 2½ miles of 4-inch mains and sink an artesian well.——Bay City, Mich.: The water works will be extended and improved at a cost of $75,000.

BIDS AND CONTRACTS.

Marysville, Kan.: Bids are wanted for the erection of a fire proof county court house, on or before June 3. Address James Montgomery, Clerk of Marshall Co.——Orlando, Fla.: Until June 1, bids will be received for the erection of a court house. Address J. N. Bradshaw, county clerk.——Port Huron, Mich: Proposals are wanted until May 30, for the erection of a brick passenger station. Communications should be addressed to J. Spicer, Gen'l M'g'r Chicago & Grand Trunk R'y, Detroit, Mich.——Harrodsburg, Ky.: Sealed proposals are invited until June 15, for the construction and maintenance of a Herdic system pump and stand pipe water works on the franchise plan. The plant calls for about 4½ miles of mains from 12 to 4 inches; 70 double nozzle fire hydrants. Address P. S. Dedman or C. E. Clarke, committee.——Orange, N. J.: Sealed proposals for the construction of approximately 103,000 feet of pipe sewers, and 11,000 feet of brick sewers, and appurtenances, will be received at the office of the city clerk until noon of June 8.——Tarrytown, N. Y.: Sealed proposals will be received at the office of the Board of Water Commissioners until 4 P. M., May 30, for making certain repairs and alterations to the low service distributing reservoir, and for a quantity of stop valves.——Port Jervis, N. Y.: Proposals are invited until May 29, for the construction of about 15 miles of pipe sewers. Francis Marvin is President of the Board of Sewer Commissioners.——Dallas, Tex.: J. C. O'Connor, President of the Dallas Opera House Company, wants bids for the remodeling of the opera house.——Cameron, Tex.: Proposals are wanted until November 7, for the erection of a building for the First National Bank. Address J. C. Reese, Chairman Building Committee.——Norfolk, Va.: Proposals are wanted until July 27, for the erection of a county court house and jail. Address I. H. Harn, Clerk of the Board of Supervisors of Warwick County.——North Yakima, Wash.: Bids are wanted until June 15, for the construction of a system of sewers. Address F. M. Spain, city clerk.——Lynchburg, Va.: Proposals are wanted until June 1, for furnishing and erecting Two Outside Packed Plunger Steam Pumps, with boilers, steam and water connections complete, of two (2,000,000) million gallons each. Also for One Compound Pump, Outside Packed Plungers, of three (3 000,000) million gallons in twenty-four hours. Call on, or address J. B. Page, superintendent.——Red Wing, Minn.: Proposals are wanted until May 27, for the erection, including steam heating plant, of the State Reform School. Address W. B. Dunnell, architect, Minneapolis, Minn.——Lincoln, Neb.: Proposals are wanted, no date specified, for the construction of a system of water works. Address Adna Dobson, city engineer.——Bedford, Ohio: Proposals are wanted until June 1, for the erection of a church. Address F. W. Landfear, Chairman Building Committee, Baptist Society.——Brooklyn, N. Y.: Proposals are wanted until May 27, for doing the steam heating and plumbing work in the Thirteenth Regiment Armory. Address Mayor Alfred C. Chapin.

THE MASTER PLUMBERS.

If you are going to attend the meeting of the Master Plumbers in Cincinnati in June don't forget the Old Reliable and justly popular Big Four Route, running the finest trains and being the only line from Chicago that lands passengers in the Grand Central Station, Cincinnati. Reduced rates will be made for the meeting. Address for rates, etc., J. C. Tucker, General Northern Agent, 234 Clark street, Chicago.

ROSE POLYTECHNIC INSTITUTE.

The Rose Polytechnic Institute, an advertisement of which appears in the present issue of the SANITARY NEWS, is one of three or four schools in the U. S. which are especially devoted to the education of Civil and Mechanical Engineers. One of the peculiar features of the Institute is the thorough and extensive "shop practice" of the students in Mechanical Engineering. Not only are machines designed and working drawings made, but actual construction is required and is made possible in extensive workshops, the equipment of which has cost over forty thousand dollars. H. T. Eddy, the new President, is well known as the Dean of the Faculty of the University of Cincinnati, and a great educator and organizer.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

DIRECTORY.

The names of subscribers inserted in this list on payment of $2 per year.

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SEWER BUILDERS.

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Dee, Wm. M., 164 Adams street.
O'Brien, T. M., 5, 84 La Salle street.

SEWER PIPE.

Connelly, Thomas, 14 Fourth avenue.

CHICAGO PLUMBERS.

Baggot, E., 171 Adams street.
Breyer, E., 72 W. Randolph street.
Breyer, C., 833 Milwaukee avenue.
Canty, John, 3105 State street.
Cameron, Alexander M., 135 W. Van Buren street.
Denniston, J. A., 148 N. Clark street.
Gay & Culloton, 50 N. Clark street.
Gundermann Bros., 182 North avenue.
Hickey, A. C., 75 S. Clinton street.
Kelly, Thomas & Bros., 75 Jackson street.
Meany, John, 5745 Wentworth avenue.
Moylan & Alcock. 103 Twenty-Second street.
Murray, A. W., 811 W. Madison street.
Nacey, P., 339 Wabash avenue.
Neustadt, Fred., 300 North avenue.
Reilly, Joseph & Bro., 517 W. Madison street.
Ruh Valentine. 548 Wells street.
Sanders, P. & Son, 1413 Wabash avenue.
Sullivan, John. 37 Siegel street.
Tumulty, J. W., 2251 Cottage Grove avenue.
Wade, J. J., 112 Dearborn street.
Weber & Weppner, 244 N. Clark street.
Whiteford, David, 372 W. Randolph street.
Wilson, Wm., 3907 Cottage Grove avenue.
Young & Cavanah, 995 W. Madison street.

SITUATIONS WANTED.

PERSONS DESIROUS OF SECURING SITUations in any of the professions, trades or businesses to which this journal is devoted are cordially invited to use this column. Advertisements will be inserted free, and answers can be sent in care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

SITUATION WANTED.—BY A YOUNG MAN 25 years of age, eleven years' experience at plumbing and gas-fitting; considered a first-class hand, and a fast workman; have been in business for myself (up to Jan. 1st) nearly 5 years; understand drainage, drawing plans and estimating thoroughly; job in growing town in the South preferred. Must be steady. Address PHILADELPHIA PLUMBER, care THE SANITARY NEWS.

SITUATION WANTED AS TRAVELING SALESman in the line of plumbing or steam goods. Have had several years experience in retail store, can estimate any of this kind of work; strictly temperate. Address, R. B. this office.

SITUATION WANTED.—BY A YOUNG MAN who has had one year's experience with supply house in this city. Some expeaience with stock and is well acquainted with prices. Address R. J., care THE SANITARY NEWS.

SITUATION WANTED.—BY A YOUNG MAN as book-keeper in a plumber's office. Have had several years' experience in that line of business. Address, "M. F.," care of THE SANITARY NEWS.

WANTED. A POSITION AS GENERAL SUPerintendent or foreman in plumbing establishment, by a Philadelphia practical plumber. One who understands the business thoroughly, and also the chandelier business. Has been in business and has been foreman in chandelier factory and has been plumbing inspector in Philadelphia. Can estimate from plans and specifications, and can draw plans. Address, W. 412 Greenwich St., Philadelphia, Pa.

SITUATION WANTED. — WITH MANUFACturer or Jobber in the supply business, by an unmarried man of good address. Have had seven years experience with the Plumbing and Steam Heating trade in the East and am rated as a salesman of ability. Can give reference. Address W. M., care of THE SANITARY NEWS.

SITUATION WANTED—BY A PRACTICAL man as book keeper in plumbing shop. Thoroughly understands the business. Address, F. D. GASSMERE, 3632 Wentworth Av., Chicago, Ill.

SITUATION WANTED—BY A YOUNG MAN to take full charge of a plumbing supply business. Has had ten years' experience and can furnish the best of references, as to character and ability. Address, "W," care THE SANITARY NEWS.

SITUATION WANTED—AS RETAIL GAS FIXture salesman, or plumber's book-keeper and collector. Might form a partnership with some practical plumber who is already established. Ten years' experience, abundance of references. Address, K. C., care THE SANITARY NEWS.

SITUATION WANTED—BY A PLUMBER, GAS and steam fitter; 22 years old; single; strictly temperate; served four years. Can furnish good references and would like work in or near Chicago. Address, "W. A. F.," care of SANITARY NEWS.

WANTED. — POSITION BY A GRADUATE engineer; three years experience in city work and one year as instrument man on railroad construction, fair draughtsman and letterer. Reference given. Address, Engineer, care THE SANITARY NEWS.

SITUATION WANTED.—By a married man, position as traveling salesman for plumbing, gas fixtures, or steam fittings; or would take charge of plumbing shop. Am a practical plumber and gas fitter. Have been in business. Can furnish satisfactory references. Address, "T. B." THE SANITARY NEWS.

SITUATION WANTED BY A PRACTICAL water-works man; is a first class meter hand, having had eight years' experince on meters. Address, 'Meter," care THE SANITARY NEWS.

SITUATION WANTED.—A YOUNG MAN OF 19 desires a place to finish up his trade at plumbing and gasfitting; has had one and a half years experience. Address, J. H. S., 1018 Market St., Pottsville, Pa.

SITUATION WANTED.—POSITION AS FORman or traveling salesman with first-class establishment, or in speciality work of water closets; have been in the plumbing business twenty-two years; am forty years old and married; can furnish good reference. Address "Foreman" care THE SANITARY NEWS.

SITUATION WANTED.—PLUMBER'S BOOK Keeper; age 21, located with a prominent city shop; thoroughly understands the business: can estimate from plans and specifications. Reference: Present employer. Address A, 34 W. 60 St, New York City, N. Y.

SITUATION WANTED.—BY A YOUNG MAN as bookkeeper and collector in a plumbing shop; have some knowledge of figuring. Best of references. Address, "D," care THE SANITARY NEWS.

HELP WANTED.

OUR READERS ARE CORDIALLY INVITED to use this column when in need of help in any of the professions, trades or businesses to which this journal is devoted. Such advertisements will be inserted free, and answers can be addressed care of THE SANITARY NEWS, *88 and 90 La Salle Street, Chicago.*

WANTED—AT ONCE—TEN FIRST-CLASS responsible salesmen who thoroughly understand the plumbing, steam-heating, gas-fitting, and machine supply business, to sell to the jobbing and small trade. WESTERN MERCANTILE CO., C. N. HOOPER, Manager, Dubuque, Iowa.

WANTED.—A MAN ABOUT 30 YEARS OF age who has been accustomed to working specialties with Architects. Address J., care of THE SANITARY NEWS.

WANTED.—A GOOD PLUMBER, GAS AND steam fitter. Married man preferred. Must be sober and reliable. Steady employment. Wages $18.00 per week. Address H. C., care THE SANITARY NEWS.

WANTED.—A GOOD STEADY MAN FOR A steady job at good wages; one with a knowledge of the tinners' trade, and plumbing as well. Address, E. B. WILLIAMS, Ironwood, Mich.

WANTED—GAS FIXTURE MAN FAMILIAR with city retail trade with a few hundred dollars, to take half interest and full charge. Will put in two thousand dollars or more; location, Hyde Park. Address "G. F.," THE SANITARY NEWS.

WANTED.—A RESPONSIBLE PARTY TO form Stock Company and put on the market a valuable article. The fullest investigation solicited. Address, "S. C." THE SANITARY NEWS.

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Dr. J. A. Bovett, 2-sty and bst brk brn, 25x82, 1246 Michigan ave	5,000
A. J. Alexander, 16-sty and bst brk office bldg, 140x80, cor Randolph and Clark sts; a, D. H. Burnham	600,000
Miss M. Howlett, 2 4-sty and bst brk str and flts, 38x64, 1518-20 Wabash ave; a, W. H. Drake	40,000
J. J. Lichtenthal, 4-sty and bst brk flts, 22x72, 127 Larrabee st	8,000
Frank D. Hyde, 3-sty and bst brk dwllg, 42x55, 600-02 N. State	20,000
Hy. Schwellkopf, 4-sty and bst brk str and flts, 40x92, 248-50 Clark st; a, E. Krause	20,000
H. Gunderlock, 3-sty and bst brk str and flts, 23x22, 1978 W. Lake st	7,000
Horace F. Huestes, 3-sty and bst brk flts, 22x 60, 598 Fulton st	5,000
John Drier, 5-sty and bst brk str and flts, 25x96, 1841 State st; a, Fred Aldshlaeger	19,000
J. N. Ott, 3-sty and bst brk flts, 23x51, 182 Warren ave; a, Flanders & Zimmerman	7,000
S. W. Roth, 3 2-sty and cel brk flts, 20x46, 93-5 Darlin st	10,000
John Jauck, 4-sty and bst brk str and flts, 25x63, 424 E. North ave	10,000
B. F. Philpot, 3-sty and bst brk addn, 25x20, 1261 Michigan ave; a, F. W. Perkins	10,000
Julius Thompson, 4-sty and bst brk str and flts, 33x39, 87 S. Clinton	6,000
Henry Wood, 2 3-sty and bst brk dwllg, 50x33, Lake ave	12,000
Jos. Mathansen, 3-sty and bst brk str and flts, 21x80, 40 Fisk st	9,500
Arnold Bros., 7-sty and bst brk str and wrhse, 30x156, 153-55 W. Randolph st; a, I. C. Zaraisel	55,000
H. S. Ames, 1-sty and bst brk facty, 134x125, 392 400 Twenty-sixth st; a, Baumann & Cady	8,000
C. J. Harmon, 2 2-sty and bst brk dwllg, 44x55, 1569-71 Harvard st; a, Park & Fuller	6,000
H. B. Ornsley, 4-sty and bst brk dwllg, 25x52, 142 Astor st; a, D. A. LePoint	9,000
A. C. Honore, 7 1-sty strs, 148x42, Michigan ave and Sixteenth st; a, Mr. Palmer	7,500
D. F. Graves, 3-sty and bst brk flts, 23x67, 121 Loomis st	6,000
Armour & Co., 2-sty and bst brk barn, 72x124, 1051-55 James ave.; a, Armour & Co	10,000
H. Dibble 1 sty brk addtl sty, 188x96, 153-69 Franklin st; a, Holabird & Roche	15,000
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Clinton Phelps, 3 2-sty brk dwllgs, 21x37, Fifty Ninth nr. Sherman st	10,500
Drebeliveck & Co., 2 2 sty frm and stn dwllgs, 21x46, 6633-35 Horner st	6,000
H. H. Mather, 2 2-sty and bst brk flts, 38x57, 1846-48 Wright st	9,000
W. E. Shaughnessy 3-sty and bst brk str and flts, 24x80, Fifty-ninth and Halsted sts; a, Fred Ahlschlager	10,000
John N. Trainor, 2-sty frm hotel, 44x105, 5556-58 Lake ave.; a, D. Ross	10,000
M. Lewis Swift, 2 3 and 2 2-sty and bst brk dwllgs, 70x63 and 35x32, 4124-30 Berkely ave.	20,000
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A. H. HARRYMAN, - - - - - - - - - EDITOR.
HENRY R. ALLEN, - - - - - - - - LONDON AGENT.

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The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

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Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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CONTRACTING NEWS—

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THE man who reads and keeps up with the advancement his trade, studies his work and applies himself closely to his bu ness, is the one who succeeds. The people soon find such a m out and then their interests are intrusted to his care. Reputati once started is like a fire in a stubble field: It soon spreads.

WE never knew of a man taking his watch, when it was out order, to a shoemaker to learn what was the trouble with it, b we have known of men selecting about everybody but plumbers inspect plumbing. The inconsistency of some men is past und standing.

WE would like to ask the building owners of this city, wh would the value of their property be if the plumbing in it we allowed to be as bad as that suffered in the buildings of so other cities—such as usually exists in cities which have no plum ing regulations or inspection, or licensed plumbers? Good plum ing adds more value to property than any one other part of a bui ing.

WHERE you cannot have both, have less expensive furnitu and more expensive and better plumbing. The one may give y some comfort and satisfy your pride, but the other will give y health and security against disease, and serve you better than a gratification of pride or the indulgence of luxury.

THE agitation of the question of a clean city for the World Fair is proper and right. That year will require a larger expen ture for street cleaning and garbage disposal than other years account of the greater number of persons in the city. This mak it necessary that an additional tax levy should be made to provi the means to meet the additional expense. Chicago, also, has reputation to sustain, aside from looking after the health a comfort of the people. Patriotic motives have actuated the pr jectors and promotors of the exhibition, but if Chicago wants reap a benefit from it and sets about it in the right way, it is well and good. If the real estate board reap a benefit from t clean condition of the city, that is nobody's business, and h nothing to do with the important question of cleanliness. T city must be clean and respectable and present a decent appea adce if it make every real estate dealer in the country a millionai We have before us the lessons of Philadelphia and Paris, a should avoid the errors and evils that befel those cities duri their expositions. We do not believe in spasmodic efforts cleanliness. The city should be kept clean at all times, but it necessary that extra efforts should be made during the fair, a the work cannot be commenced too soon.

THERE is no reason why every body who builds should n have a perfect sanitary job of plumbing put in his house. There a plumbers ready to do the work and the material for that kind of job is plenty. The builder can blame no one but himself if h fail to get that kind of work done.

REMEMBER that in plumbing, as in everything else, yo generally get what you pay for. If you pay for a poor class work, you need not expect to get a good job. This is pla enough for every one to understand.

IN an address before the Missouri State Medical Associati the President, A. B. Sloan, recommended that every hotel an boarding house should be licensed from a sanitary source befo opening. He asked for legislation for the establishment of state chemist to investigate articles of food. He stated that n a gallon of pure cider vinegar could be bought in the ordina store. He mentioned instances of samples of adulterations household articles such as cream of tartar. He scored the sta of Missouri for not making an appropriation of $6,000 for a sta board of health and showed that an appropriation for the pr tection of domestic animals was made and one for the Columbia exhibit, but no appropriations for the people themselves. Th recommendation was made not for doctors but for the peopl The county health board law was as it now is pronounced nullity. Additional legislation is demanded. It was asked include in his call for the legislature these two public healt matters. It is difficult to understand how legislators can be

slow and indifferent regarding provisions for the public health; they can lavish money on everything else yet they clutch the purse strings when it comes to matters of health, the highest public interest.

Building owners should take a peep into our sewers and then ask themselves if they want the foul gases arising therefrom to enter their houses. If they do not there is a way to prevent it. This is easy and simple. Get a reputable plumber to put in the plumbing and there will be no danger from sewer gas and its attendant evils. A poor job of plumbing is simply the branching of sewers into houses. It supplies flues up which the gas ascends laden with disease. If this poison is not wanted in the house get a good plumber to do the work and it will be completely shut out. There is no question about that. It has been fully demonstrated.

There is danger in going to the low-priced, cheap plumber to get work. It may not always be the case, but in most instances the low-priced man is a poor workman and a skinner. No one can have poor plumbing done at any price; he cannot afford to have it put in for nothing. There is economy in having good work done besides the security it affords in the matter of health. Pay a good plumber a good price and get good work should be the rule.

Beginning with next week's issue of The Sanitary News there will be a department conducted by Andrew Young devoted to the abatement of the smoke nuisance, embracing the methods adapted and progress made in different cities, latest inventions, discoveries, and results of experiments, tests, etc., together with all matters of interest to this important factor in the cleanliness and health of cities. In this, as in all matters of sanitary reform, The Sanitary News continues in the lead.

POPULARIZING SANITARY REFORM.

An exchange informs us that sanitary reform in the matter of street cleaning has taken a novel course in the city of New York. Prominent ladies are forming a society the members of which are required to sign and keep the following pledge:

1. I will have the sidewalk in front of my residence and place of business swept early every morning and no rubbish shall be swept therefrom into the street.

2. My ash barrel shall be put out every day at the proper hour, and taken in as soon as it has been emptied. It shall be kept within the stoop line, and not on the outer edge of the sidewalk. It shall never be filled so full that it cannot be lifted and emptied into a cart without spilling. To prevent dust, I will have water sprinkled lightly over the ashes in the barrel.

3. I will not mix papers with the ashes and garbage, nor throw them into the street. (Papers should be burned, sold, or given to a junkman.) I will not throw orange nor banana peelings nor fruit of any kind upon the sidewalks or into the gutters.

4. I will be watchful of the general condition of the streets, and if I notice negligence or carelessness on the part of the householders or city employes I will promptly report the same by mail or in person to your office, 222 West Thirty-eighth street.

No dues are charged and no assessments are to be levied, because a public-spirited gentleman has contributed funds sufficient to pay the expense of the movement for at least one year. All that is required is that the signers shall keep their pledges, in which event it is confidently expected that the streets will show so much improvement that the future of the society will be practically foreshadowed.

The idea behind this movement to secure clean streets is simply a focusing of community interest. In a republic the people are the government, and in the matter of sanitary reform, as a level-headed woman remarked before the society under comment, at one of its early meetings, "We cannot expect more from the city government than we can get from the citizens."

This movement might extend its scope to the backyards and the alleys and bring about better hygienic results than by confining its attention to the streets. It is the out-of-the-way corners that catch rubbish and decaying matter, and one neglected cellar is apt to have more offensive and polluting matter in it than can be found in the garbage receptacles of an entire square.

If every individual in a city appreciated the fact that he is to some extent responsible for the condition of the public health, and in order to keep his conscience clear kept his backyard, cellar, alley and street clean, the reports of the commissioner of public health would show the results of the multiplied effort.

NOTES AND NEWS.

The Roman authorities propose to cure the commercial vice of adulteration by the publication, in the daily papers, of the names of all makers and venders of food substances which are adulterated or injurious to health.

The buildings intended for the Williamson Free School of the Mechanical Trades, for which the late Isaiah V. Williamson gave $2,000,000, are now in course of erection 10 miles from Philadelphia, and applications for admission are now being received.

The Pratt Institute, at Brooklyn, N. Y., admits women to its classes in architecture, and has already had a number of such students who have done good work.

Minneapolis, Minn., has a new 12-story office building, 172 feet high, on the roof of which is a garden laid out with gravel walks and beds of flowers and plants. The building was erected for the Northwestern Guaranty Loan Company.

In the early days of steamships on the Atlantic, the steam pressure carried was five pounds only above the atmosphere, and the engines made from 10 to 12 revolutions per minute, the vessels made 8 knots per hour, on an average. Now we carry exactly 36 times the pressure, make seven times the revolution, but go only 2½ times faster.—*The Engineer*, New York City.

According to the new Kansas law creating a State Board of Public Works, the board will be composed of three members at a salary of $1,000 per annum, not more than two of whom shall belong to any one political party, and at least one of whom must be a practical mechanic. The board will have charge of the construction of the state buildings, and it succeeds all other state building boards.

In order to help keep Pittsburg streets clean the Ladies' Health Association of that city propose to send a paper, in the form of a pledge, to each householder and business man, and ask them to sign it and return to the secretary of the association. The paper will ask that each one will have the sidewalk in front of their residence or place of business swept early in the morning, and no rubbish shall be swept therefrom into the street; the ash barrel shall be put out at the proper hour and taken in as soon as emptied; to prevent dust the ash barrels will be sprinkled; papers are not to be mixed with the ashes nor thrown into the street; nor will banana or orange skins be thrown into the street or on the sidewalk. The persons also pledge themselves to be watchful of the general condition of the streets, and all things noticed which are detrimental to the cleanliness or health of the city will be reported to the society.

No normal type of man could flourish in a sewer, and no civilization makes headway where soap is scarce and impure air inflates the human lung. Crime, like a maggot, has ever fattened on such impurities, and the omnious discontent of the present age is the most intense where the sanitary laws are the least regarded. On the line of this indisputable verity, civilization constructs its sewers, regulates the sanitary conditions of school houses and prisons, and, as a continuance of the same good work, has started the crusade against the chimney.—*Ex.*

Suppose a medium-sized sitting room with four people and two gas jets; the air must be changed every fifty minutes to keep it pure. As air is heated it expands and becomes lighter per cubic foot. If all the air is heated equally, it remains at rest after expansion; but if hot air is in the presence of cold air, the latter, by reason of its greater heaviness, forces its way down and drives the hot air up. The moving force of air currents is the greater weight of the colder air. This, then, is the force by which we are to drive out foul air and put pure air in its place. Pure external air will always drive out foul air if you give it a chance. In a room the air arranges itself according to its temperature; the hottest lies along the ceiling, the coolest along the floor. The hottest is the newest and purest. The coolest is the oldest and therefore the foulest. The air is gradually cooling from contact with the walls and

windows. When hot air enters a room, it rises at once to the ceiling, and spreads across it. If there is an escape there, an open window or ventilator, it goes out, leaving the cooler foul air almost undisturbed. From this we see that a window slightly open at the top may cool a room but not purify it.—*Ex.*

SANITARY PROVISIONS OF MILWAUKEE.

MILWAUKEE, May 14, 1891.—THE SANITARY NEWS: I have refrained from replying to your kind communication of Feb. 11th until this time, for the reason that I was not able to give you a complete resume of the sanitary legislation with which I have been more or less connected during the past year. There were quite a number of bills presented to the State Legislature which were of more or less sanitary importance. Some of them passed; some were mutilated; some were killed. On the whole, however, I think we may feel encouraged at the advancement made under the circumstances.

Among the more important measures which passed are the following: Chapter 181, an act to amend the city charter of Milwaukee, giving the Common Council greater power by ordinance, which reads as follows: "To compel owners or occupants of any grocery, cellar, tallow chandler shop, soap factory, tannery, stable barn, privy, sewer, sewer connection or other unwholesome house or place, to cleanse, remove, construct, re-construct, abate, or locate the same in such place and from time to time as often as it may be deemed necessary, for the health, comfort and convenience of the inhabitants of said city."

Chapter 472, an act relating to the disposal of garbage and other refuse matter of the city of Milwaukee, which reads as follows: "The Common Council of the city of Milwaukee is hereby authorized and empowered, and it is hereby made its duty, with the advice of the mayor and the health commissioner of said city, to enter into contract, or otherwise provide at the expense of the city, for the sanitary disposition of all slops, offal, garbage and animal matter in said city, or to be accumulated in said city (either within or without said city) for such term or time as may be agreed upon; and, provided, that before any contract shall be entered into with any person, company or corporation, for the disposition of such garbage, etc., intending to conduct said business in any town in Milwaukee county, the approval of the town board of health of such town, of the location for the conduct of such business shall be first obtained, and, provided that nothing herein shall be construed to authorize the continuance of or renewal of a contract for the disposal of the same at the crematory now located in Menominee valley, in said city."

Chapter 431, an act relating to the sale, transportation and packing of unwholesome, stale, emaciated, blown, putrid, or measly flesh of deceased animals, which reads as follows: "It shall be unlawful for any person to sell or expose for sale, or to give away for the purpose of food, or to can or pack for the purpose of transportation and sale to other markets any unwholesome, stale, emaciated, blown, tainted, putrid, or measly meat or the flesh of any deceased animal or of any animal that shall not have been slaughtered for the purpose of food, knowing or having good reason to believe that such meat is unwholesome, stale, emaciated, blown, putrid or measly, or that such flesh is the flesh of a deceased animal or of an animal that shall not have been slaughtered for the purpose of food.

"It shall be unlawful for any person or corporation owning or operating any slaughter house or packing establishment within the state of Wisconsin, to receive for the purpose of killing or to kill any diseased animal, or to render the carcass of any animal that shall have died by disease or through exposure, or that shall not have been butchered for food, knowing or having good reason to believe that such animal or animals were diseased or had died from disease or exposure, or that the same shall not have been butchered for food.

"Any person found guilty of any violation of this act shall, for each offense, be punished by imprisonment in the county jail not less than ten days nor more than six months, or pay a fine of not less than ten dollars nor more than one hundred dollars, or both, in the discretion of the court."

Also to amend the charter of the city of Milwaukee giving the commissioner of health greater power, which reads as follows:

"Section 4. The commissioner of health shall give such directions and adopt such measures for cleansing and purifying such buildings, lots and other places, and for causing the remo therefrom of any wells, cisterns, privy vaults, urinals, sinks, sl hoppers, defective plumbing or any sewer connection, and of nauseous substances producing a disagreeable smell or tending cause sickness or disease as in his opinion may be deemed nec sary; and he may do or cause to be done whatever in his ju ment shall be needful to carry out such measures for the preser tion of the public health. Any person who shall disobey any or of the Commissioner of Health, which shall have been persona served upon him requiring him to abate or remove any nuisa or to cleanse or purify any premises owned or occupied by hin such order before the Municipal Court of said city, be liable arrest and summary trial and punishment by fine, not exceed five hundred dollars ($500), or by imprisonment not exceeding months, or by both such fine and imprisonment in the discretion the court."

During the past year several important ordinances have b passed, among which are the following:

"Section 211. Whenever in the opinion of the Health C missioner, any privy-vault, slophopper, water closet, urinal, sink any sewer connection shall be offensive, or dangerous to pub health, and need cleaning, repairing or renewing, it shall be duty to notify the owner or agent to clean, repair or renew same within a period named in said notice; and also to serv printed copy of the last fourteen sections of this chapter. S person, owner or agent so notified and failing to comply with s notice within the time mentioned, shall on conviction, be fined a sum not less than ten dollars or more than fifty dollars for e and every offense. In case no agent or owner can be found in city, the Commissioner of Health shall cause such offensive va to be cleaned, the expense to be collected as in other cases removal or abatement of nuisances."

Also an amendment to Section 212, amended to read as follo "It shall be the duty of each and every householder in the city Milwaukee to report to the Commissioner of Health of said c every person in his house or residence laboring under any of following diseases, to-wit: Smallpox, scarlet fever, diphthe asiatic cholera, malignant measles, enteric fever (or typhoid fev typhus fever (or ship fever), or other dangerous contage diseases, within twenty-four hours after he shall ascertain or s pect the nature of such disease, unless such persons so labori under any of the aforesaid diseases is attended by a physici and in such case it shall be the duty of such physician to ma such report provided that the report herein required to be made physicians may be sent by mail, addressed to the Commissioner Health, or left at the health office, and notices so mailed or giv within the time specified shall be deemed a compliance with t provisions of this section. Any person who shall neglect or refu to perform the duty required of him by this section shall be c sidered guilty of an offense, and upon conviction thereof, shall punished by a fine of not more than one hundred ($100) dollars each offense."

There is an ordinance now before the Council providing for t location and construction of privy-vaults, which provides that vault shall hereafter be constructed or built on any street avenue where sewer and city water supply are furnished, and th on other streets and avenues they shall be constructed as follo "No vault shall be located on the front of any lot or within thr feet of the lot line, or within 20 feet of any well of water, and such vaults shall be built of brick or stone laid in hydraulic ceme and made water-tight, and be ventilated in such a manner as n to annoy any resident of any neighboring building.

The milk ordinances of the city are now being thoroughly ov hauled, but the progress has not advanced to that stage where am able to give any definite report. Also an ordinance to fix t time for the removal of noxious and offensive substances and t manner of their removal from the city, which is as follows:

"Section 1. No person or persons shall remove or cause to removed, carried or conveyed, any noxious or offensive substanc in, upon or over any of the public streets, or alleys of the city Milwaukee between the hours of 8 P. M. and 10 P. M. in the mont of May, June, July, August, September or October, and all ca for removing the said noxious or offensive substances shall water-tight and covered, if so required by the Commissioner

Health. Penalty for violation of any of the provisions of this ordinance shall not be less than five dollars ($5) or more than fifteen dollars ($15) for each and every offense."

A resolution has also been passed by the Common Council appropriating three thousand dollars for the purpose of establishing a disinfecting corps connected with the Health Department for the purpose of carrying out preliminary disinfection. A patrol wagon and disinfecting van are at the present time being built for this purpose.

A further report of this idea will be defered until the system has been put in operation and thoroughly tested; in addition to this service there will be a chief disinfector and sanitary detective.

Very truly yours, U. O. B. Wingate, M. D.,
Commissioner of Health.

PRIVATE OWNERSHIP OF SEWERS.

The *Engineering News* in discussing the sewerage of Plainfield, N. J., wherein water works is proposed, says that not one-third of the cities and towns in the United States having water works are provided with sewers of any sort, and there are only two cities in the United States—Natchez, Miss., and Shreveport, La.—where a water company has constructed sewers in connection with its water works. Moreover, careful inquiries have resulted in establishing the fact that but five or six towns or cities in the country have sewerage systems built by private companies. In addition to the sewerage works already named, private ownership of sewerage systems prevails at Atlantic City, Asbury Park and Long Branch, N. J., and at Houlton, Me., the sewers in the latter place having a length of but 7,800 ft. In other localities sewers have been built by land or similar companies to assist the development of other property, and there are of course, instances where residents of a street have clubbed together and built a sewer for their own service.

Private companies have heretofore made and are now making applications for sewer franchises, but such schemes do not meet with public approval, and from the very nature of a sewerage system private ownership is a dangerous expedient. No other form of public works seems so ill-fitted to be turned over to a private corporation for money-making purposes, a statement which is borne out by the fact that no well managed municipality, or poorly managed either, so far as we know, has ever attempted to derive a net revenue from its sewerage system, while many municipalities do aim to secure a revenue, above all charges, from their water works.

The legal merits of the Plainfield case have been decided by the Supreme Court. It is certain that the citizens are right in protesting against the construction of a sewerage system, the plans for which have not been openly presented for the inspection of all interested, and indorsed by eminent sewerage engineers. And even with the latter conditions fulfilled it would be a most doubtful policy, under any circumstances, to grant a franchise for a sewerage system to a private company. It is not a proper subject for private speculation, and in private hands is very likely to be ill managed or neglected.

HEATING BY HOT AIR.

The *Wiener Bauindustrie Zeitung* makes some sensible remarks about warming by means of hot air, says the *American Architect.* It is hardly necessary to say that the Germans give great attention to everything relating to the hygiene of school-rooms, in particular, and their observations on such subjects are well worth remembering. The author, apparently the editor of the journal, mentions that the principle on which systems of hot-air warming are based is, usually, that the warm, fresh air will ascend immediately to the top of the room, and, as the supply continues, will gradually push downward the cooler foul air which has accumulated in the lower portion, and, if openings for escape are provided near the floor, will drive the foul air entirely out through them, particularly if the exit through the floor-openings is hastened by connecting them with a flue in which a current is induced in some way. This theory is familiar enough to us; in fact, nearly all our commercial ventilating systems are founded upon it, and the pictures by which their proprietors illustrate them to the unscientific mind show, in the most satisfactory manner, the space just above the floor in the apartments to which it is applied filled with black, rolling clouds of carbonic acid and organic miasm, constantly replenished by currents sent downward from the breathing apparatus of the figures which animate the scene, while the whole upper part of the room shines like a sunset sky with the pink which represents fresh air, and which is shown entering in beneficent abundance half-way up the wall, while the black miasm hurries out through ventilators near the floor. The truthfulness of this representation is enforced upon the mind of the public by the observation that carbonic acid is heavier than air, and must naturally sink to the bottom of the room, and that it is better to draw it off from that point, without letting it mix with the pure air coming in above; and even those who know that the carbonic acid in a school-room rapidly diffuses itself through the entire atmosphere of the room are likely to think that the noxious animal exhalations can best be removed at the floor, keeping the upper part of the body immersed in the inverted lake of fresh, warm air which constantly descends from above. The writer of the article, however, says that, in practice, as soon as a room ventilated on this system has been occupied a little while, complaint invariably begins to be made that the air is "too dry." To remedy this defect, pans for evaporating water are placed in the fresh-air supply ducts, but without much success; and as the complaints still continue, the teacher is usually obliged, even in the coldest weather, to open a window, to relieve the headaches, lassitude, and difficulty of breathing which prevail through the room.

The explanation of this phenomenon, which, we venture to say, is very familiar to teachers in our city schools, is given by our German authority as follows: It is perfectly true that the warm, fresh air, supplied in any part of the room, but, more particularly, if it is applied through inlets six feet or so from the ground, as is now the usual rule in school-rooms, to prevent the current from being felt by the children, as a cool draught rises immediately to the ceiling, and, as more is supplied, fills the room, from the above downward, with fresh air, at a temperature which is probably about 80° Fahrenheit at the ceiling, and diminishes to 70° at the level of the children's heads, the mass working downward, in the middle of the room, where it is not influenced by the chilling effect of the walls and windows, at the rate of perhaps four inches a minute, supposing that the size of the inlets is in the usual proportion to the dimensions of the room, and that a free escape is provided at the floor for the foul air. Meanwhile, however, all the people in the room are sending from their lungs currents of warm air, exhausted of oxygen, and loaded with carbonic acid and organic exhalations, which, instead of descending at once to the floor, as the pictures would have us believe, insist upon taking the course which specific gravity, instead of hygienic propriety, dictates to them. The temperature of the exhaled breath is about 90°, and, although its greater proportion of carbonic acid would make it heavier than pure air, at the same temperature the difference in temperature of about 20° between it and the surrounding fresh air makes it enough lighter to ascend, until it reaches a stratum of exactly the same specific gravity as itself. As the surrounding air is warmer near the top of the room, while the exhaled breath cools in rising, it may be roughly estimated that the latter comes to rest somewhere about three feet above its starting point, and, as it cools, and consequently descends, with the stratum of fresh air to which it has attached itself, it comes back, in eight or nine minutes, to be breathed over again by the people who had just respired it. The same operation goes on constantly, so that the unfortunate scholars, in practice, get nothing to breathe but their own breath, about eight minutes old, mixed, by diffusion, with a certain quantity of fresh air. Of course, this is, hygienically, very objectionable. The author does not point out any method for arranging a more satisfactory system, but most architects, with this suggestion as to the demerits of the common system, could devise some improvement.

THE NINTH ANNUAL CONVENTION.

Chicago, May 26, 1891.—The Sanitary News: The Ninth Annual Convention of the National Association of Master Plumbers, of United States, will take place in the Scottish Rights Cathedral, in Cincinnati, O., Tuesday, June 23, 1891, at 10 o'clock A. M. The Gibson House, Walnut street, between Fourth and Fifth streets, will be headquarters. Terms, $3 per day. Other rates as follows: Grand Hotel, American plan, $2, $2.50, $3, $4,

according to the location of the room. Dennison House, Main and Fifth streets, $2, $2.50 per day, special rates for convention, $1.50. Hotel Emery, European plan, $1, $1.50, American plan, $2, $2.50, for each person. Burnet House, American plan, $3, $5, per day. The Stag Hotel, European plan, rooms from 50 cents to $1.25.

The Central Traffic Association, the Southern Passenger Associations and the Trunk Line Association, have granted us reduced rates at one fare and a third, for the round trip. Certificates must be obtained from the ticket agent and brought to the convention where our National Secretary will sign them at the meeting. The signature on the certificate will entitle them to their return fare at one-third regular rates. The Western Passengers Association, and the Boston and New York Lines Passenger Committee, have refused to grant us any reduction. The Trans-Missouri Association I have not heard from yet.

All indications from different parts of the country point toward the largest and most interesting convention ever held. It is the earnest desire of the National Executive Committee that no one will be furnished with delegate badges from any city except those who are regular delegates.

Please give this space in your valuable paper, and oblige

Very truly yours,

Robert Griffith,
President, N. A. M. P.

THE PROBLEM OF WATER PURIFICATION.

Perhaps the most important sanitary question now pressing for solution is that of a pure water supply for our towns and cities, says the American Medical Association *Journal*. As this country becomes more populous, the streams and lakes receive more refuse and sewage, until the purification of the water supply for a given locality has become the crying need. Statistics show that at least 55 per cent. of the waters supplied to cities and towns are obtained from surface sources and are necessarily liable to more or less contamination. Various remedies have been sought for this condition, the most practical thus far suggested is to prevent the contamination, by carefully guarding the lakes or rivers from which the supply is obtained. It is at once apparent that only a certain degree of security is reached in this way, as it is clearly impossible to perfectly guard an extended water shed.

Aside from organic or infectious pollution, surface waters frequently contain fine particles of inorganic matter in suspension, or they are more or less discolored and so rendered unsightly and distasteful. This is especially true of many river waters, even when they are wholesome so far as health is concerned. Natural springs with deep wells have been considered the best sources of water supply, but unfortunately their range is limited and they offer no practical solution of the water supply of our larger towns. If we consider for a moment the sources of spring water we find that it was originally precipitated upon the surface, but as it percolates through the sand, gravel and stratified rocks it gradually looses its suspended matter and becomes clear and sparkling. The earth acts as a great natural filter and waters found at any considerable depth are usually free from dangerous contamination, unless there has been sufficient pollution of the surface to extend some depth into the soil.

In the treatment of polluted waters this natural process should as far as possible be imitated, and we believe that it is precisely upon these lines that the solution of our water supply problem is to be reached. Filtration, however modified, has always been based upon one principle, that of forcing water through a substance with pores sufficiently fine to entangle the suspended organic and inorganic matter. Almost every conceivable porous substance has, at one time or another, been used in filtering water. These, however, may be divided into two classes: first, those consisting essentially of a porous plate or bed, such as sandstone or unglazed porcelain; and secondly, those in which a porous mass is formed by a substance in a fine state of subdivision, such as sand, gravel or charcoal. So far as we know, the first class have never been used on a large scale, though good results have been obtained where but a limited supply of water is required. The chief objection to filters of this class is that the interior of the bed or plate cannot be cleaned. Laboratory experience shows that bacteria soon make their way through plates of this kind. A further serious objection is that they cannot be adopted for the filtration of water upon a large scale.

The sand filter in its various modifications is the only one that has been adopted in the filtration of waters for towns and cities. Excellent results may be obtained by simple beds of sand, allowing the water to flow over the surface and percolate through to a suitable collecting chamber below. Filters arranged upon this plan purify most of the water supplied to the city of London.

The chief objection to gravity sand filters is their great size, and cost of maintenance. The outer layer of sand must be removed every few days and fresh sand substituted; and, unless the bed is carefully prepared and the water evenly distributed over the surface, crevices will form, through which the water flows without filtration.

A modification of the sand filter is one in which the bed is surrounded by a shell, and the water is forced through by hydraulic pressure; this force if sufficient forms the sand into an evenly resistant compact mass, comparable to a very soft sand-stone. A filter constructed upon these principles and filled with fresh clean sand will give a pure sparkling water for some hours, but the outer layers soon become foul and clogged, and little or no water can be passed through; it is therefore necessary to either renew the sand, or to have some means of thoroughly and efficiently cleaning it. It is just at this point that inventors and engineers have failed. It is apparent that a filter constructed upon such principles, if the bed cannot be thoroughly cleaned, is worse than useless, it becomes indeed a positive source of danger; it is this defect that has rendered some of the devices now on the market worthless.

It has been demonstrated that a simple bed of sand arranged in this way will remove all suspended matter and most of the bacteria. Can we not look for mechanical devices that will easily and cheaply cleanse this sand? This once accomplished, one of the greatest sanitary problems of the age will be solved, and public health have taken a long step in advance.

THE UTILIZATION OF SEWAGE.

The Houghton-le-Spring Local Board of Health recently consulted Mr. D. Balfour, M. I. C. E., as to a satisfactory system for disposing of the sewage. After a deputation of the Board had visited a number of different sewage schemes over the country, the Board decided to adopt the scheme recommended by Mr. Balfour as the most efficient and economical in the circumstances. The process consists in first mixing the sewage in large tanks (in duplicate) with alumino-ferric, a cheap chemical (which contains 46-7 per cent. of sulphate of alumina), which is suspended in iron baskets or cages, immersed in the sewage to admit of the necessary proportion being dissolved to effect precipitation. It does not, like a large number of chemicals, require any machinery, or add any bulk to the sludge, being entirely soluble in water, and, moreover, exercises a deoderizing effect, and also is not liable, being a neutral salt, to refermentation. The clarified sewage is then passed on to ten acres of loam land laid out for intermittent filtration, which consists in forming the land into half-acre beds, broad-ridged and furrowed, and used in regular rotation, and having special under drainage with ventilation shafts, from which, with regular and systematic management, the effluent will pass in a colorless and inodorous state. As sufficient suitable land could not be obtained, this chemical precipitation process was conjoined with the available limited land for the purpose of chemically precipitating and deodorizing the solid matter as much as possible before applying the sewage to the land. Various succulent crops including vegetables and osiers, are grown on the ridges, the sewage filling the furrows.

HOW TO PRESERVE IRON.

Investigations of the effects of so called preservative substances on iron have led Prof. Lewes to believe that protectives of the class of tar and its derivatives, such as pitch, black varnish, asphalt and mineral waxes, are among the best. This, however, is conditioned upon the removal of the small quantities of acid and ammonia salts which frequently occur in tar and tar products. If, in addition to this, the class of substances mentioned is applied hot to warm iron, the bituminous and asphaltic substances form

on the surface of iron an enamel which is not, like other coatings, microscopically porous, and therefore pervious to water. Spirit or naphtha varnishes are condemned, varnishes to which a body has been given by some pigment, generally a metallic oxide, are preferable to the last class, if the solvent used is not too rapid in its evaporation, and if care has been taken to select substances which do not themselves act injuriously upon iron, or upon the gums or resins that are to bind them together.

ARTIFICIAL WHITE CEMENT.

There is certainly a demand, says the *American Architect*, for a strong white cement, with which to make objects of artificial stone which shall be of pleasanter color than those made with dark gray Portland cement, or the still darker brown Rosendale cement. The native carbonate of magnesia, or magnesite, if originally of a light color can be calcined, at a low heat, into a white cement, which is stronger than the best Portland; but magnesite is rather a rare mineral, and the cement made from it is expensive. Quite recently, successful attempts have been made in Germany, to make an artificial white cement of the same character as Portland cement, by grinding together three parts of chalk and one of kaolin, burning at a red heat and grinding again. The cement made by this process, hitherto has shown a tensile strength only about one-half as great as that of good Portland cement, but it has the hydraulic quality and other characteristics of Portland cement, and it is to be hoped that the manufacture may be so improved as to increase the tensile strength to the point required for making artificial stone. If a white cement can be found for a matrix, it will be easy to obtain aggregates of light color, by utilizing white sand, marble dust, white talc and so on, suitable for making a concrete which could be used in place of marble.

CONVENIENT TO HAVE ABOUT.

The *American Machinist* says that vaseline is one of the best things for preventing bright iron work from rusting.

If matting, counterpanes, or bedspreads have oil spots on them, wet with alcohol, rub with hard soap, and then rinse with clear cold water.

Boiling in strong soap suds will remove char from lamp burners.

Steam pipes are now made of ramie fibre and the material is pressed so closely together by means of hydraulic machinery, that it has a tensile strength two and one half times that of steel. —*Invention*, London.

Gum arabic will give a good gloss to black ink without making it sticky.

When boots and shoes have become hardened by water and it is desired to render them pliable wash them with kerosene.

"Burnishine" is the name of a new metal polish favorably spoken of by *Hardware*. It can be used upon brass, copper, zinc, steel, bronze and other metals. The polish is applied with a woolen cloth after which a few lively rubs are given, and a final rubbing off is given with a dry cloth. "Burnishine," it is represented, will not injure gold or silver, and will not become hard or gummy like paste polish.

To make ink for rubber stamps use a mixture of glycerine and alcohol, and color with aniline, dilute with water to make it work satisfactorily.

A blue ink can be made of sulphate of indigo diluted with water until the desired color is produce. It is with this sulphate, largely diluted, that the faint blue lines of account books are ruled.

A pleasant household deodorizer is made by pouring spirits of lavender over lumps of bicarbonate of ammonia.

Isinglass boiled in spirits of wine will produce a transparent cement which will unite broken glass so as to render the fracture almost imperceptible.

A woman who is a passionate lover of flowers, and, being city bred, regards them as a luxury, says that after wearing roses an entire evening she is enabled to bring them to life again by a hot-water bath. When she finds that from any cause whatever the blossoms droop and threaten an early death, she clips the stems, and, by letting the stalks rest for a while in steaming water, finds every leaf revive and freshen under the process.

An ingenious Frenchman has discovered a process of discovering the tin contained in the wash waters of silk which have been weighted, and has accordingly received from the French Society for the Encouragement of National Industry the prize allotted for the utilisation of residual substances. Upon this the Colliery Guardian remarks that as it is estimated that Lyons alone will effect an annual economy of £12,000 by these means, the gentleman deserves his reward. But the history of the reclamation of waste products, although it has been full of surprises, and may be considered an amazing testimony to the genius and patience of man, contains nothing more remarkable than this profit derived from the refuse of this excessive adulterant. The question has been more than once asked why silk rags had no value, but they may yet be sought after by dust contractors and marine store dealers, not for the sake of silk, but of tin, and if we had an industrial mint, we might contemplate the contigency of an old silk gown, split and torn, because it was as much metal as textile, being converted into a dripping-pan or some other kitchen utensil.

BRASS MAKING.

The business of brass making requires intelligence and scientific acumen. The process of manufacture is not the least uninteresting, and may be briefly described: After weighing out the proportions of metals, they are melted in crucibles, holding anywhere from 20 pounds up, in a furnace. The metal is then poured into cast-iron molds, made strong, and thus the brass ingots are formed, varying in size, and are from three to fourteen inches wide, from one to five feet long, and from one to four inches thick. The ingots are trimmed by cutting off with a huge pair of shears weighing several tons the rough portions formed in casting by the mouth of the mold, then passed to the rolls, which are of chilled iron, twenty inches or more in diameter and three feet or over long, and are reduced by degrees to the required thickness. It can be reduced only a little in thickness at each rolling. After passing through the roll once it becomes hard and brittle, and before it can be reduced further it must be annealed. The annealing is done in furnaces called mufflers, which are shaped like ovens, from 5x30 feet upward in width and length. Each time, after annealing, the metal has to be cleared of the smoke and oxide, and this is done by immersing it for a time in a bath of sulphuric acid. The temper of the brass depends mainly on the manner of rolling; the color, ductility and other properties depend upon the proportions of the ingredients. Lead, tin, and antimony are sometimes added in small quantities to produce brass of a quality suited to a peculiar work.—*Ex.*

CLERK OF THE WORKS.

The committee on the employment of clerks of works and superintendence appointed by the American Institute of Architects, at their last annual convention held in this city, have issued their report in pamphlet form for distribution. The report encourages the employment of clerks of works and cites the practice in England, where it has proved very successful. The committee urges the importance of a correct understanding of the situation by employers and clients, and adds:

"Many employers think that they are really paying an architect enough to demand his constant attention. Most of them think that he should have at least a representative constantly at the work; and perhaps all of them believe, and in this way are supported to a surprising extent by legal opinion, that an architect is in the position of chief builder in the commercial and responsible sense as well as the technical. And they put him in the position of the contracting party, with the real contractor as his employee or subordinate.

If this relationship were logically established and paid for at such rates of commission as it would demand—probably 14 or 17 per cent.—it might have some advantages, but it would destroy the disinterested attitude of modern architects; and in any case it is not the real state of affairs with which we have to deal.

Your committee feel the desirability, therefore, of bringing to the notice of the public, and of their legal advisers, the existing facts.

First. That an architect offers and is for only a certain limited kind of superintendence.

Second. That it is to the interest of the employer in many cases to pay for constant detailed superintendence.

Third. That an architect is in no sense a contractor, nor is he responsible for the contractor's mis-doings, and that the commissions usually paid would be utterly insufficient for any such services or responsibilites, even if they were desirable.

Your committee is further of the opinion that the best means of bringing these facts to the notice of employers are for the present the addition to the schedule of authorized charges of a clause stating the rates at which clerks of works will be supplied. In other words, it is advised that the employment of clerks of works should be assisted and encouraged by the announcement of regular rates as an extra to the schedule."—*Building Register.*

IRON AND STEEL IN CONSTRUCTION.

The question how best to place incombustible material in buildings so as to attain the nearest approach to a fire proof structure, says *American Manufacturer* is one that deserves the most careful consideration of architects and all who have to do with the erection of buildings. The disastrous fires which occur too frequently even in the better classes of buildings in which iron and steel are quite generously used, point out clearly that the use of iron and steel must not stop with the putting in of a few girders and columns where strength with a minimum of weight and bulk is a desideratum. The futility of this as a safeguard against destruction of a building by fire has been exemplified again and again in this and every other city in the country. It does not even provide "slow burning" construction. A building may be as strong as iron will make it, but if that iron is only disposed in the form of columns and girders, fire will go through it as quickly as though there was not a piece of iron in it larger than a nail.

As yet, the uses of iron and steel have not become general in construction, have been mainly confined even in the better buildings to girders, columns and floor beams, leaving to be built of wood all interior details. About the only lighter form of building material in which irom in any marked degree has supplanted the use of wood is in the various forms ot metalic lathing, and these have shown their superiority from both technical and economical standpoints so well as not to need any further comment here.

The state of things noted above has not been entirely the fault of oversight of architects either. Manufacturers have provided in abundance beams and all the heavier structural shapes, but what may be termed the artistic treatment of iron has been practically neglected, and architects have been forced to use wood for interior work from the very lack of other suitable material. Taking these facts into consideration we would urge upon manufacturers that more attention be turned to the production of material suitable for architectural details.

The solution of the problem calls for the exercise of both artistic and mechanical ability of no mean order, but we believe it is within the reach of American artisans if effort is intelligently turned in that direction, and that such efforts would receive the co-operation of our best architects, and be reciprocated by them we are confident. The difficulties to be encountered from a mechanical, commercial, and, we may add, from an æsthetic standpoint, are no greater than have been met and overcome again and again by engineers, and the benefit to be derived both by the promoters of such improvements and the users are far more certain than those which many other things once innovations but now virtual necessities, have had to contend with. Who will take the level through this almost untrodden field?

POLLUTION OF WATER SOURCES.

J. Milton Titlow, who is connected with the Bureau of Surveys, has written a paper advocating that the matter of pollution of water supplies be intrusted to state authorities. He says:

"The pollution of the streams from which the water supply of our cities and towns must come makes it absolutely necessary for the health of the inhabitants that the state, the only authority having sufficient jurisdiction, should enact measures for their protection.

"In England, where free pollution is prohibited and restricted, within the last five years wonderful advances have been made in utilizing waste products; so that in many cases the recovery has actually been remunerative. Similar evidences can be given in this city, since she has instituted measures for the protection of the water supply at Fairmount.

"Nature has wonderful recuperative powers, as illustrated in many of our streams. Observe, for instance, the nasty, black sulphur water, in which nothing can live, flowing over a bed of coal-dirt on the Schuylkill at Port Clinton, only seventy-eight miles above the Fairmount pool, from which the clear glass of water upon your tables is taken, and only thirty-eight miles above our favorite fishing grounds for black bass—below Pottstown.

"If it were not for this pollution I believe the Schuylkill River would be one of the best black bass waters in the country, for its generally rocky and gravelly bottom, dashing rapids, followed by pools, are such as this gamey, small mouth species thrives in. The State of New York has lately secured land for a park in the Adriondacks, and the time is ripe and the opportunity favorable for the anglers of Pennsylvania to further advocate and press the mrtter."

FOR THE DIGESTION.

Lillie—Oh Minnie, I have such a dear unique headrest. I have stuffed a pillow full of Cholly's love letters.

Minnie—What a soft pillow it must make.

Curio Dealer—Here's a skeleton of George Washington's pet cat.

Collector—I don't want one so large. What's this small one.

Curio Dealer—That's the skeleton of the same cat when it was a kitten.—*Chicago News.*

If you are playing poker with an experienced dealer you need not get scared until you get a good hand.—*Dallas News.*

Wool—"Do you know anything about the doctrine of election? Van Pelt—"Only in a general way—vote early and otten."—*New York Herald.*

Philadelphia Girl.—"Dear me! My watch is nearly an hour slow." New York Girl—"Well, dear, that isn't much for Philadelphia."—*Jewelers' Weekly.*

Mrs. Wedgewood—I know I'm cross at times, John, but if I had my life to live over again I would marry you just the same.

Wedgewood—I have my doubts about it, my dear.—*Epoch.*

It is hard to satisfy everybody. Consumers complain of short weight in delivering coal, and dealers complain of long wait in paying bills.—*Somerville Journal.*

First Juryman—"Well, we are agreed, with the exception of Biggars. I have argued with him until I am worn out, but he seems to be immovable." Second Juryman—"Immoveable? Why don't you say fixed?"—*Indianapolis Journal.*

Wife—"Did you change the dress pattern and blow the man up for the mistake?" Husband—"I had it changed, but the clerk declared that he knew you were wrong." Wife—"Well, what did you do about it?" Husband (grimly)—"I shook hands with him." *Cloak Review.*

He (at 11:45 p. m.)—"Time waits on no man." She—"I don't blame it. It would lose lots of sleep if it waited on some persons I know."—*Detroit Free Press.*

"Brudder," said the Reverend Poindexter Granberry, "gib yo' alms while yo' has a chance, so dat yo'll find a due bill waitin' for yo' at de gate."—*New York Herald.*

"I tell you, old man," said the detective, "you ought to consult a physician. You don't seem like your old self." "Hush," was the reply. "Big case. I'm in disguise."—*Washington Post.*

Mamma: I'm afraid George's habits are not exactly what they should be. Gertie: Why, how do you mean? Mamma: Well, he appears to be a trifle lax about his personal appearance, for one thing. Gertie: Goodness! he appears personally three nights in a week; but I'll give him permission to come oftener, if you wish, mamma.—*Puck.*

Dr. Pillsbury—"Well, Mr. Skeptic, did you follow my prescription?"

Skeptic: "No, if I had I would have broken my neck."

Dr. Pillsbury: "Why, what do you mean?"

Skeptic: "I threw the prescription out of the window."—*Chicago America.*

Teacher—"You say there are six senses? Why, I have only five. Scholar—"I know it, sir. The sixth one is common sense."

Mother (sternly)—"Why did you tell that lie to the teacher?"

Johnny—"To save somebody from punishment."

Mother (mollified)—"I knew there must be some extenuating circumstances. Who was it you wished to save from punishment?"

Johnny—"Myself."—*Boston Traveller.*

AFTER THE SMOKE NUISANCE.

The following cases were sued before Justice Bradwell May 26, for violating the smoke ordinance, with the results as appended:

Chicago Sugar Rfinning Company, foot of Taylor street, $25 and costs; C. C. Hiessen, 319-21 Dearborn street, $25 and costs; Board of Trade, corner Jackson and LaSalle street, $25 and costs; Spiegel and Company, 249-51 State street, $25 and costs; Chicago Edison Company, 185 Adams street, $25 and costs; M. Shields and Company, 143-45 State street, $25 and costs; Cereal Milling Company, Dearborn and Sixteenth street, $25 and costs; Martin Dawson Company, 216-18 Kinzie street, $20 and costs; W. B. Conkey, 341 Dearborn street, $50 and costs; Chicago Grain Elevator Company, Rush street bridge, dismissed; Hotel Richelieu, Michigan avenue, dismissed; L. J. McCormick, VanBuren and Michigan avenue, dismissed.

TRADE AND BUSINESS NOTES.

A short sojourn in Louisville, Ky., recently was enhanced in enjoyment and made pleasant by a visit to the widely-known firm of the Ahrens & Ott Manufacturing Company located at 327 and 329 West Main street. They are wholesale dealers in plumbers', foundry, and machinists' supplies, and manufacturers of all kinds of brass goods. They produce a superior quality of goods in their line, and through their enterprise, promptness and integrity, hold for Louisville the supremacy throughout the great Southwest in the lines of staple productions in brass and iron work for steam, gas, and water, and plumbers', foundry and machinists' supplies. This business which has grown to such proportions was first established in 1859 by Mr. Theodore Ahrens, who as a skilled brass founder and master machinist, developed a flourishing trade. He had repeatedly to enlarge his facilities, and early as 1872 Mr. Henry Ott was admitted into copartnership under the firm name of Ahrens & Ott. The house continued pre-eminently in the lead, progressive and enterprising, and eventually in 1886 the important interests were duly capitalized, and "The Ahrens & Ott Manufacturing Company" incorporated with a paid up capital of $100,000, which was increased in 1890 to $200,000, Mr. Theodore Ahrens becoming president, Mr. Henry Ott, secretary, and Mr. Theodore Ahrens, Jr., treasurer. These gentlemen bring to bear special qualifications for the discharge of the onerous duties devolving upon them, and have developed the model establishment of its kind. The factory is situated on Bullitt street, and is of immense size, running clear through to Fifth street, between Main street and the river. It is a substantial four-story brick, 50x300 feet in dimension, and is fully equipped with improved machinery and appliances. The basement is devoted to storage, etc.; main floor to the machine shop; second floor to the brass finishing department; third floor, complete foundry equipment for turning out all sizes of brass castings; and in the above department upwards of 85 skilled hands are employed under the personal supervision of Mr. Louis Ahrens, who gives all orders in this department his individual and personal attention.

The company's salesrooms, warehouse, and offices are centrally located at Nos. 327 and 329 West Main street, where they occupy a fine four-story brick building, 30x200 feet in size; also two four-story warehouses on Murrell court, directly in rear of main building, are needed and utilized to carry the largest and most complete stock of supplies for water, gas, and steam to be found anywhere south of the Ohio river. They also handle full lines of patented and other specialties of other leading manufacturers. The company's trade relations are of the most extended character, and their traveling salesmen cover every section of the United States.

Four-fifths of the business done in Louisville in their line is controlled by them, which is evidence of their popularity and reliability. Their stock is complete and of the best quality, and their promptness and fair dealing have won them the enviable reputation they enjoy. They are just issuing a new 500 page catalogue and price list, elaborate and attractive, which they will send the trade on application. Among the specialties they manufacture are the well known "A. O." hydrants and steel washers which are known to, and popular with, the plumbing trade throughout the country. They also manufacture a full line of improved water gages and Blakeslee jet pumps,but to enumerate the articles they produce would fill a volume. Plumbers and steam fitters, as well as blacksmiths, millwrights and all machinists will find here a complete line of tools of superior grade at bottom prices. The firm is prosperous and reliable, and through strict business integrity and ability, courteousness and fairness in all their dealings, they have won the eminent success which they so richly deserve.

We are in receipt of a neat catalogue from the Detroit Sanitary Supply Company, of 37 First street, Detroit, Mich., presenting with handsome illustrations the features and merits of their "Clean Sweep" non-syphon sewer gas trap. This trap is placed on the market to meet the demand for a safe, reliable sewer gas trap. The illustrations show it in many farms and positions, as attached to open lavatories or shown separately. One illustration gives a section of the trap showing the water seal and air chamber above presenting the features on which are based the merits and the utility of the trap. The trap is simple and can be set in any position, and vented if desired.

PLUMBING NOTES.

The following has been sent us from Milwaukee: Since the union plumbers were locked out some of the journeymen have decided to go into business for themselves, and in this way eight new shops have been started. The men claim, however, that they have decidedly up-hill work on account of the compact that exists between the Master Plumbers' Association and the dealers in, and manufacturers of, plumbers' supplies. They say that any union plumber or other person who does not belong to the Master Plumbers' Association, can purchase such supplies only by paying an advance of 25 per cent. upon the prices paid by association members. Before the lock-out the discount in favor of members of the association is stated to have been 10 per cent. One dealer, the men say, has refused to sell goods to the new shops at all. This naturally has a tendency to discourage the journeymen who have started in business, but there is some talk of testing the legality of a combination that enables the master plumbers to obtain discrimination in their favor. The union plumbers meet every morning at a hall on Second street and compare notes. There are 130 of them locked out, and since they were discharged four men have deserted the union and returned to work. The master plumbers have induced a number of journeymen to come to Milwaukee, but the union men report that they have persuaded twenty-two of these new-comers to leave the city again. The whole trouble hinges upon the refusal of the master plumbers to employ union men. They say that they will never again have union men in their shops, and the journeymen say that they will stay out all summer sooner than break up their union. They are entitled to assistance from the American Federation of Labor, but there is no national journeymen plumbers' organization. The journeymen publish the following card: "We beg for space in your valuable paper to make a statement in regard to the lock-out plumbers. The impression is abroad that our Union has made demands, to which our bosses will not accede. This is wrong. We have made no demands. We were told five weeks ago to leave our Union or leave our jobs. We feel that we have a right to maintain an organization to protect and promote the interests of our trade. This right cannot be denied us, and it is upon this principle that we are to-day locked out." It is hardly probable that master plumbers would object to a union as a union. It is only when that union is used wrongly that it is objectionable. This federation which requires the different trades to support one another, even to the extent of unreasonable demands and strikes, is wrong in principle and can work only harm to all parties.

The plumber is no more a mere mechanic than a surgeon is. While the surgeon to be successful must possess mechanical skill, so the plumber to be successful must possess scientific knowledge.

The plumber who does good work and charges fair prices for it can be relied on to furnish good material. It is the Cheap Johns in the plumbing trade who handle cheap material and do work which is dear at any price.

A little thing is a plumber's trap,
But quite convenient to have about;
For it stops the pipe on the sewer gas
And keeps disease germs out.
But every one can't put them in,
It takes a plumber to do the job;
A tinker may make you think he can,
But it is only his scheme to rob.

It may not be that every plumber is qualified for an inspector of plumbing, but it is true that anyone not a plumber is disqualified for that position. On the whole the chances are about one thousand to one in favor of the plumber.

The man who calls plumbers thieves and skinners and complains of bad jobs, is generally the man who never wants to pay a fair price for anything, and is always trying to get the best of everyone.

The Philadelphia *Builder, Decorator and Wood-Worker*, whose opinion is to be highly valued, says: Andrew Young, whose reports as Chief of Sanitary Inspection in Chicago have become authority in city sanitary inspection, has become manager of that aggressive and progressive journal THE SANITARY NEWS. We are glad to welcome such a tower of strength to the forces of the technical press.

The following are the delegates elected to represent the Chicago Master Plumbers' Association at the Cincinnati convention: J. J. Wade, Daniel Rock, T. C. Boyd, Andrew Young, T. P. Culloton, M. L. Mandebill, P. Rediske, Wm. Bowden, R. C. Miller, J. Webber, P. Sanders, J. Matthews and Hugh Watt.

James Foley, of 220 Delaware street, Leavenworth, Kan., in sending in his subscription says of THE SANITARY NEWS: "If a business man cannot afford to subscribe for such a paper, which champions his cause in such an able and interesting manner, he would better take his kit and walk."

A microbe sat forlorn and sad
In a new house drain on the sewer side;
For the plumber had made his work secure,
And the microbe pined away and died.

David M. Quay, the reliable plumber of 816 Walnut street, Kansas City, Mo., writes as follows:

I am glad to see the interest you are taking in the matter of sanitation and, also that you advocate the matter of the plumber being recompensed for his services, especially where he gives his best thoughts to his business and uses his best efforts to improve the sanitary condition of work and the passage of proper sanitary laws. I wish you success and promise you my support. Mr. Quay enclosed the subscription price of THE SANITARY NEWS, and his encouragement is most thankfully received.

If you want to build a house,
A palace or a cot,
Put the best of plumbing in
Or you'll be in it not.

Plumbers, give us your co-operation and we will give you a plumbers' journal that will fitly represent your extensive and important trade. Our circulation is rapidly increasing, and we wish all who read this to remember that THE SANITARY NEWS is a weekly journal and only two dollars per year. Remember it, and speak to your friends of it.

If a tinner meet a doctor
Coming through the rye,
If the tinner greet the doctor
Should the doctor sigh?
No indeed he'll never sigh,
For well he knows, too true,
The greater practice he will have
When tinners plumbing do.

We would like to see in the reports of the health departments of our cities a chapter or so devoted to the condition of plumbing. There is always mention of garbage disposal, street cleaning, contagious diseases and the like, but nothing can be found to indicate that any notice has been paid to plumbing. This is about the most important subject that should come under the direction and care of boards of health, and yet it seems wholly neglected. It should be made a distinct feature of the health department and receive full consideration in the reports. If plumbing and plumbers were to receive the official recognition due them, and that which their importance demands, the health of cities would be enhanced and the sanitary conditions of homes materially improved. The trouble lies in the fact that practical men, men who understand plumbing, experienced in its construction, are not placed at the head of a department to regulate it, and thus one of the most important agencies in the sanitation of cities is neglected.

TOPEKA, Kansas, May 20, 1891.—Editor THE SANITARY NEWS: The Kansas Master Plumbers held an annual meeting in Topeka Monday, May 11, and elected the following officers for the coming year: C. J. Prescott, president, Topeka; Thomas Lloyd, vice-president, Kansas City, Kansas; F. W. Doane, secretary, Lawrence; Robt. Mood, treasurer, Topeka: The following members were elected delegates to the Cincinnati convention: C. J. Prescott, Topeka; James Foley, Leavenworth; John Shehan, Topeka; A. H. Nooney, Topeka; A. T. Buckridge, Wichita. The following alternates were elected: Thomas Lloyd, Kansas City, Kansas; H. Ingham, Fort Scott; Robt. Mood, Topeka; G. C. Hargreaves, Kansas City, Kansas; J. H. Beasley, Pittsburg. Our organization is in good condition and we shall be at Cincinnati with a full delegation. Respectfully, C. J. Prescott.

If any one tell you that tinkers can plumb,
Don't believe it a minute;
For when you want work as it ought to be done
The tinkers are not in it.

Mr. W. E. Goodman, of Milwaukee, Wis., gave THE SANITARY NEWS a pleasant call this week and informed us that the master plumbers of that city were still holding out against the strike and would continue to do so. They granted the journeymen the eight hour day and made all concersions justice and right demanded. The trouble now is the journeymen will not work on a building where there is employed any man who is not a union man, no matter what his trade is. This is a matter over which the master plumbers can have no possible control, as hod carriers, masons, carpenters and the like, are not subject to any rules of the master plumbers. The result is the master plumbers of Milwaukee have determined to employ non-union men only. There are forty-five shops in the city and they have all agreed to employ no union men, and have advertised for non-union plumbers. They have endured the dictations of the union men as long as they could, and have now resolved to do without them entirely.

W. J. Fitzpatrick, president of the Brooklyn Master Plumbers Association sends us the following list of delegates from his association to the National Convention, with his kind regards to the Chicago master plumbers: Wm. J. Fitzpatrick, chairman, Wm. J. Gault, secretary; M. J. Lyons, George Cummings, Thomas H. Radcliffe, George B. Lewis, Martin Fallon, H. M. Noble, John Danaher, G. A. Smith, Joseph Zoll, Wm. H. Heron, Wm. Donivan, John J. Keenan, James Travers, Patrick Dunn, Bernard McBride, O. O. Sawkins, Wm. Keegan, M. J. Farrell, J. C. Gunning, John McConnell, John Gannon, Wm. J. Roche, Wm. C. O'Kiffe, E. McDonald, John Bosch.

The following are the alternates: Owen Marrin, James McManus, Wm. J. McCaw, John H. Read, Paul Ayres, S. J. Thatcher, F. J. Firth, R. J. Knox, Charles Sheppard, P. H. Bennett, J. W. Bliss, Thomas C. Curtis, D. Covert, I. W. Dean, J. J. Dillon, E. Dyer, Wm. Donaghy, D. Gateson, F. J. Gatley, M. F. Gleason, Jas. Hussey, Wm. Heslin, Jos. Logan, Wm. McDonald, Thomas Munckenbeck, John Newman.

The following delegates have been selected to represent the Cleveland Master Plumbers' Association at the National Convention: William H. Henderson, W. A. Kelly, and Adam Schneider.

ST. PAUL, Minn., May 26, 1891.—THE SANITARY NEWS: I send you the names of our delegates to the National Convention of Master Plumbers: W. J. Freaney, J. T. Homes, and J. J. Dunnigan, the veteran delegate of St. Paul. We have a good asso-

ciation here and hope to have still better. Plumbing quiet; competition close. Wishing you success, I remain, respectfully yours, Bart Culleton, Secretary M. P. A.

Through the kindness of Mr. Daniel J. Barry, Secretary of the Baltimore Master Plumbers' Association, we are enabled to publish the following list of delegates elected from that association to the National Convention: John Trainor, Chairman, Daniel J. Barry, Daniel Sullivan, William Dunnett, George Knipp, Joseph Mitchell, William Rothrock.

WHERE PLUMBING WORK IS BEING DONE.

5100 Aberdeen street, D. T. Dewar; 729 Alport ave., J. Hoes; 815 Ashland ave., J. Hoes; 7017 Avenue A, J. J. Rourke; Arthington near Centre ave., J. McDonald; Albany and Polk, W. H. Cummings; Archer and Lock, Sherman & Bro.; 2953 Aberdeen, Morris Bros.; 715 Bloomingdale Road, H. Brewer; 5244 Butterfield, P. Schmidt; B street, James Bunting; Bremer west of Oakley, R. C. Miller; 33 Cherry Place, Nelson & Keilhofen; 4442 Carpenter, A. Miller; Cottage Grove ave. and Sixty-third, D. Walsh; South Chicago and Sixty-seventh, D. Walsh; 228 Cortland, H. Brewer, Jr.; 10 Commercial, H. Brewer; 438 Custom Place, P. Schmidt; 1065 California, Steiner; 308-310 Cleveland ave., Bayha & Bachman; 427 Cleveland ave., Newstadt; 261 Clark, A. Bensmeyer; 298 Cortland, Harvy & Mose; 20 Commercial, J. Franklin; 5153 Centre ave., Morris Bros.; 82 Division, Nelson & Keilhofen; Division and Western ave., Nelson & Co.; Dobson bet. Seventy-fifth and Seventy-sixth, J. B. Scheulls; 384 Dudley, H. Breyer; 4511 Dryer, Steiner; 1116 W. Division, George Miller; 690 Dania ave., Harvey; 2734 Dearborn, John Teutsch; Emerald ave. near Sixty-seventh, Lee; 6512 Evans ave., J. B. Sheville; 86 Evergreen, H. Breyer; 7008 Emerald ave., P. Schmidt; Elkgrove ave., J. Bunting; 6800-6802 Emerald ave., F. Murphy; 6923 Emerald ave., F. Murphy; Fiftieth and Ellis ave., J. J. Wade; Fisk and Eighteenth, C. Kostlevy; Fletcher bet. Paulina and Wood, P. H. McCabe; 329 Fifty-ninth, J. B. Sheville; Fifty-fifth southwest cor. Lake ave., J. J. Rourke; 271 Fairview ave., H. Breyer; 199 Forrest ave., H. Breyer; 539 Fifty-fifth street, J. Emflem; Fifty-fifth and Bridge Works, Lyon & Lee; Forty-seventh near Cottage Grove ave., Molter; 80 Flournoy, O. J. Brooks; Forty-ninth and Butterfield, F. N. Kuhn; Fifty-sixth and Wallace, F. N. Kuhn; Flournoy east of Sacramento, John Welsh; Fisk bet. Thirty-third and Thirty-fourth, F. Murphy; 26 Fullerton ave., P. Feltman; 1323 Grace, Molter; 431 Garfield boul., George Oliver; George bet. Southport and Lincoln ave., P. Feltman; Green near Eighty-fifth, L. Clarke; 16 Hinsche, O. Roderwald; Hedwig near Kosciusco, H. Breyer; Halsted and Thirty-seventh, Connell; Hastings west of Roby, P. Becker & Co.; 5939 Halsted, Frank Falk; 6422 Honore, F. Murphy; 6648 Halsted, F. Murphy; 4432 Indiana ave., Wm. Bowden; Kimball near Milwaukee ave., H. Breyer; Langley ave. and Sixty-third street, D. Walsh; 585 Larrabee, Molter; La Salle and Fifty-seventh, D. F. Dewar; 3625 Lincoln, Steiner; Logan and Wallace, Chs. Boyd; Leavitt and Campbell Park, Coolidge & Co.; 253 Larrabee, Bayha; Lincoln near Division, F. Falk; 6010, 6012, 5927 Loomis, Morris Bros.; 390 Leavitt, Hamblin; 124-126 May, W. E. Brown; 3665 Michigan ave., A. Keeley; 5805-7 Madison ave., J. B. Sheville; 226 Myrtle ave., H. Breyer; Maryland ave. near Sixty-fifth, P. Schmidt; Madison ave. and Fifty-first, Mandable; 2934 Michigan ave., Mandable; Marshfield near Taylor, G. A. Teke; 41 Maud ave., Bayha; 69 Moffat, Harvey & Mose; 3150, 3210 Mospratt, Morris Bros.; 3430 Marshfield ave., Morris Bros.; Marvin and Washtenaw, H. Mund; 150 Monroe, D. Daly; 626 Noble ave., P. and H. McCabe; Ninty-first and Erie ave., J. J. Rourke; 63-65 Olive, Chs. Walters; Ohio and Springfield, H. Breyer; Orchard near North ave., Molter; Potomac and Rockwell, Nelson & Co.; 141 Perry ave., H. Breyer; Paulina near Taylor, Sims & Son; 4520-23 Page, Morris Bros.; Prairie ave. near Forty-second, Noodly; Rockwell & Seymour, H. Breyer; 885 Racine ave., Nelson; Robey & Thomas, Frank Falk; 19-21 Ray, F. Murphy; State northeast cor. Twenty-fifth, Nash; 779 Southport avenue, McCabe; 2926 Shields ave., Wm. Bowden; St. Lawrence and Sixty-fourth, D. Walsh; 130 Samuel, F. Falk; State bet. Twenty-fifth and Twenty-sixth, Mandable & Co.; 6842 Sherman, T. Bryson; 379 Sixteenth, Kostlevy; Sixty-seventh near May, Morris Bros.; Southport ave. and Fullerton ave., P. Feltman; 1789 Thirty-fifth, Colter & Son; 5433 Tracy Avenue, J. B. Sheville; 1557 Twelfth, S. Smith; Troy north of Twelfth, Smith; Twelfth and Cypress, E. Baggott; Turner west of Ogden ave., P. Becker; Twenty-second east of Boulevard, Kostlevy; 927 Thirty-first, Morris Bros.; Twenty-ninth and Dearborn, Morris Bros.; 5325 Tracy ave., P. K. Hardin; Twenty-seventh northeast cor. Cottage Grove ave., J. Teutsch; 674 Van Buren, McDonald; 3602 Vermont, Colter & Son; Van Buren and Francisco, W. H. Cummins; 105 Vedder, Bayha; Vincennes ave. and Thirty-eighth, Nash; 1285 Van Buren, Hamblin; 5115 Wentworth ave., P. Schmidt; 5116 Wentworth ave., P. Schmidt; Wallace near Thirty-first, J. J. Quinn; Woodlawn, D. T. Dewar; 451 Warren ave., Love & Liebolt; 4090 Wentworth ave., A. Miller; Winter bet. Seventy-ninth and Eightieth, Lyon & Lee; 100 Willow, J. Lnez; Woodside and Addison, McCabe; 488 Wells, J. A. Voltz; 997, 859 Washtenaw, H. Breyer; 520 Wells, Molter; 6832 Wright, D. T. Dewar; 1019 Washtenaw, Steiner; Wabash ave. south of Fourteenth, Nash; Walnut west of Albany, Coolidge & Co.; 3409 Wood, Morris Bros.; 3628 Wentworth ave., Morris Bros.; 4403 Wentworth ave., John Teutsch; 5426 Wentworth ave., John Teutsch.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Treat & Foltz have prepared plans for a 5-story hospital to be composed of three isolated buildings 225x106, to be erected at the northeast corner of Dearborn and 26th streets, by the trustees of Wesley Hospital. The construction will be of brick, and the building throughout will be appointed on the most approved plan; cost, $75,000. Burling and Whitehouse have in preparation plans for a 5-story business block, 40x175, to be erected at 262-264 Wabash avenue by William Blair. It will be warmed by steam and will be supplied with a full equipment of freight and passenger elevators; cost, $45,000. William Strippleman has planned an 8-story furniture store, 205x180, to be erected on West Madison street, just east of Halsted, by John M. Smyth. The front will be of blue and buff stone and the interior will be of mill construction and supplied with the most approved appliances for conducting the business; cost, $300,000. Jul. de Horvath has planned a 5-story and basement factory, 41x101, for the Cleveland Rubber Paint Company, to be built on Boston avenue, east of Halsted street; cost, $30,000. He has also planned a 3-story and basement flat building, 50x60, for Mr. Lawrence, to be erected on Burling street; cost, $15,000. Also a church for the Union Congregational Church at Auburn Park. It will be 58x120, and will be constructed of stone; cost, $10,000. Also three 3-story dwellings, 50x60 for F. Smith, to be erected on Homan avenue, near Garfield Park; cost, $12,000. Flanders & Zimmerman have planned a 4-story apartment house, 60x65, for the Foss estate, to be built at 9-13 Loomis street; cost; $30,000. Small & Bishop have planned a 2-story and basement flat building, 28x80, on North Normal parkway, near Stewart avenue, by Reuben Jenkins; cost, $8,000. Also a 2-story and basement flat building, 42x50, at the corner of Sixty-first street and Stewart avenue, by L. J. Shafer; cost, $6,000. Thomas & Rapp have planned a 3-story and basement apartment house, 128x50, to be built at Forty-second street and Calumet avenue by G. W. Hoffman; cost, $25,000. They have also planned a 3-story and basement school-house, to be erected at Oak Park; cost $45,000; L. G. Hallberg has planned six 3-story dwellings, 120x70, to be built on Wabash avenue, near Fiftieth street, by George A. Seaverns; cost, $35,000. He has also planned a 4-story store building for J. Jenson, to be erected on Division street, near Milton avenue; cost, $10,000. J. E. Scheller has in preparation the plans for a 4-story and basement theatre, 66x120, to be built at Joliet, Ill., by a company. It will be constructed of stone; cost, $50,000. Crowen & Richards have planned a 4-story and basement store and flat building, 50x100, to be built at 6057-6059 State street, by Mr. B. King. Pressed brick and stone construction; cost, $35,000. D. S. Pentecost has planned a 2-story and basement flat building, 50x58, for John Ganson, to be built at 1520-1522 West Monroe street. Pressed brick and stone construction; cost, $10,000. W. L. Carroll has planned a 3-story and basement dwelling, 25x78, for Dr. C. H. Loder, to be built at

Indiana avenue and Thirty-first street. Stone front with hardwood interior; cost, $6,000. A. M. F. Colton has planned six 3-story and basement dwellings, 132x44, for the McCormick Theological Seminary, to be built on Belden avenue. Pressed brick and stone fronts; cost, $35,000.——Philadelphia, Pa.: Messrs. Yarnall & Goforth have designed a large hotel to be built by a syndicate in Virginia. Moses & King have plans on the boards for two schools, a bank and seven cottages, all to be erected in South Jersey. Furness, Evans & Co. are receiving estimates upon the plans prepared for a mansion to be erected at Washington, D. C. The drawings for a residence to be erected at Chestnut Hill for Isaac Myer have been prepared by Architect T. Roney Williamson, who is also planning extensive alterations to be made to the residence of Guy E. Farquhar, at Pottsville. Work will soon be started on the new Century Club-house, on Twelfth street, south of Sansom, and upon the new office building, for Dunlap & Clark, on the south side of Filbert street, west of Thirteenth. A site for a new edifice has been purchased by the congregation of the East Alleghany Avenue Methodist Episcopal Church. The lot measures 50x100 feet and fronts on the south side of Madison avenue, west of Frankford road. 200 houses will soon be started at Fiftieth street and Greenway avenue, by William S. P. Shields, the builder. A two-story warehouse, 179.10x101 feet, will soon be erected at the northwest corner of McKean and Swanson streets by Hugh Slevin. At Twentieth and Wood streets, Carrick & Co. will erect a 4-story brick cracker bakery, 150x200 feet. Louis C. Hickman and Otto Frochter, of No. 925 Chestnut street, have made the plans for the new temple to be erected on the east side of Broad street, south of Susquehanna avenue. The main structure will have a frontage of 120 feet on Broad street, and will extend in depth a distance of 150 feet. Architect John D. Allen has altered the original plans prepared for an apartment house which Mr. Joseph M. Fox will build at the corner of Broad and Spruce, so as to provide for a six-story hotel. The contract for the erection of a handsome 5-story business house for Henry C. Lee, at 925 Market street, has been awarded to T. H. Doan. The plans were prepared by architects Collins & Autenreith. W. S. P. Shields will erect about 200 houses in the neighborhood of Fiftieth and Kingsessing avenue.——Washington, D. C.: Architect H. L. Page has plans for a brick dwelling for Mr. T. J. Coffey. It will be on K. street, between Seventeenth and Eighteenth streets northwest, and will be three stories and cellar. The cost will be $25,000. Architect C. A. Harkness has plans for a block of thirty 6-room houses to be erected at the corner of Twenty-seventh and N streets, Georgetown, for Mr. William H. Manogue. They will be two stories and will cost $35,000. Architect N. R. Grimm has plans for two dwellings to be erected at First and Carroll streets northeast for Mr. B. A. Collonna. They will be four stories and basement high. Architect Fred. G. Atkinson has plans for a brick house that M. I. Weller will have built on C street, between Fourth and Fifth streets, southeast. Cost about $13,000. A. H. Sanford, the owner of the three old brick houses on Twelfth street, just north of and adjoining the Palais Royal, will have the same remodeled and converted into modern store and office buildings. A fourth story will be added with new fronts of press-brick and Hummelstown brown stone. The improvements will cost $60,000. Architect James G. Hill is making plans for two 3-story and basement dwellings, 21x50 feet, that will be built on P street, between Fifteenth and Sixteenth streets; cost, $14,000. Architect L. E. Dessez has plans for two brick and stone dwellings which James Robbins will have built at 2110 and 2112 R street. They will be 3-story and basement, 18x53; cost, $12,000. Fred. W. Pilling has plans for a residence for William S. Teel on R street, between New Hampshire avenue and Eighteenth street. It will be 3-story and basement, 25x65 feet; cost, $13,000. Architect Charles A. Harkness has plans for a summer residence that U. S. Dunbar, the sculptor, will have built at Muskoka, Ontaria, Canada. It will be 2-story, cellar and attic, 55x52 feet, with stone base and frame superstructure.——Wilmington, Del.: Architects G. W. & W. D. Hewitt, of Philadelphia, Pa., have prepared plans for a bank and office building to be erected on Ninth and Market streets for the Equitable Guarantee and Trust Company, Wilmington, Del. To be 61.4x116.7 feet, 6½ stories, built of buff brick, granite, marble, stone and terra cotta; cost, $130,000.——Madison, Ga.: S. A. Furnell and others will erect a hotel, 100x120, 3-stories high, to cost about $20,000.——Warm Springs, Ga.: The Warm Springs Company has been incorporated, and will erect a new hotel, a large bath house and other structures, and the property will be otherwise improved at a total cost of $250,000.——Minneapolis, Minn.: W. B. Dunnell has prepared plans for a heating plant and kitchen for the State Insane Asylum at Fergus Falls. It will be 2-stories high, 94x150, and cost $45,000. The same architect has planned the State Reform School to be erected at Red Wing. The building will be 84x424, two stories and basement. ——Dayton, Ohio: Plans for bank and office building have been made by Architects Williams & Otter for W. P. Callahan, to be 50x70 feet, eight stories, built of brick, granite, marble and stone; cost, $200,000.——Findlay, Ohio: S. D. Houpt & Co. will erect a window glass factory on the South Side. Architect George J. Horn has prepared plans for a glass lamp and globe chimney factory to be erected at Alexandria, Ind., for J. Evans Lippencott, Alexandria, Ind. To be 280x640 feet, two stories; cost, $15,000. The Board of Education will receive bids for the erection of a 4-room addition to the Huber school-house, and a 4-room building to be built in the Sixth Ward.——George L. Cusac & Co. will erect a glass lamp chimney and bottle factory. To be 200x600 feet; cost, $12,000. Zanesville, Ohio: H. C. Lindsay has planned an addition to the Brown wagon works.——Scranton, Pa.: Justice Hain will erect a 6-story office building to cost about $60,000.—— Berryville, Va.: Geo. T. Pierson of Philadelphia has prepared plans for the hotel.——New York City: The Metropolitan Club will erect a building at the corner of Fifth avenue and Sixtieth street. United Charities will erect a 7-story building at the corner of Fifth avenue and Twenty second street, at a cost of $350,000.——Rochester, N. Y.: At the corner of East Main and North St. Paul streets, a 12-story brick, granite and marble building will be erected at a cost of $500,000, by Sibley, Lindsay & Carr.——Louisville, Ky.: A $30,000 dormitory will be built at the State University. The Louisville Medical college contemplates the erection of a building to cost $50,000.

HEATING AND LIGHTING.

The following new electric light companies have been formed: New companies.—Monticello Electric Light Co., Monticello, Ill.; capital stock, $10,000. People's Electric Light, Heat and Power Co., Greenville, Pa.; capitol stock, $25,000. Waynesboro Electric Light and Power Co.; capital stock, $15,000. Gettysburg Electric Light, Heat and Power Co., Gettysburg, Pa.; capital stock, $23,000. Yankton Gas and Electric Light Co., Yankton, S. Dak.; capital stock, $200,000.——Youngstown, Ohio: An electric light plant will probably be built.——Palatka, Fla.: The erection of an electric light plant is being discussed.——Chillicothe, Ill.: A company has been organized with a capital of $50,000 to furnish the city with electric lights. Address S. B. Hartz.——Rogers Park, Ill.: H. E. Keeler, N. A. Partridge and Geo. W. Walker have organized a company to build and operate gas and electric plants. The stock is $75,000.——Athol, Mass.: The gas plant will be considerably enlarged and improved.

SEWERAGE NOTES.

Florence, Ala.: $35,000 will be spent for sewerage purposes. ——Dallas, Tex.: The city council has passed an ordinance providing for the issuing of $150,000 of sewerage bonds.——Roanoke, Va.: A sewerage system is proposed.——Pittsfield, Mass.: An ordinance is before the Board of Aldermen to appropriate $100,000 for sewage disposal.——Haselton, Ohio: The question of a system of sewerage is being agitated. —Laconia, N. H.: Preliminary surveys will soon be made for a sewerage system.—— Milford, N. H.: $5,000 will be spent for sewers.——Morrisville, Vt.: The village will have surveys made for sewers.——Haverhill, Mass.: Plans are being made for sewers in the North Parish. ——Palmer, Mass.: An engineer has been engaged to make plans for sewers.——Waltham, Mass.: The aldermen have ordered the issuance of $150,000 sewer bonds for construction.—— Bridgeport, Conn.: Plans are under consideration for sewers in two recently annexed districts.——Oneida, N. Y.: E. E. Coon, L. Kenna, A. L. Goodrich and others, have been appointed as sewer commissioners to consider plans.——Weehauken, N. J.: Plans for

sewers are being considered.——Bristol, Pa.: The preliminary plans for a sewerage system have been made.——Baltimore, Md.: $28,000 has been appropriated for sewers.——Florence, Ala.: The sum of $40,000 will be expended in sewer construction.——Ishpeming, Mich.: A sewerage system will be constructed.——Hurley, Wis.: The city will issue $20,000 in bonds for sewer construction.——Lawrence, Kans.: About 8,000 feet of 8-inch sewers will be constructed and laterals placed.——Grand Forks, N. Dak.: A sewerage system will be built at a cost of $50,000.——Waco, Tex.: An ordinance has been passed for the issuance of $40,000 in sewer bonds.——Highland, Colo.: The trustees have voted $40,000 for sewer construction.——Fairhaven, Wash.: It is reported that sewerage bonds to the amount of $250,000 will be issued.——Pomona, Cal.: The sewage question is being agitated.——Boise, City, Idaho: A large amount of sewer construction is under consideration.

WATER WORKS NOTES.

Milford, Mass.: The directors of the company have voted to buy a new pump and enlarge the station at a cost not to exceed $12,000.——Webster, Mass.: A petition for authority to build works is before the legislature.——Westport, Conn.: Surveys have been made for a water supply system.——Middletown, N. Y.: A new reservoir will be built at a cost of $40,000.——Ocean City, N. J.: Address E. B. Lake for information in regard to the proposed water works.——Evansburg, Pa.: The Evans City Water Co. has been incorporated with a capital of $4,800.——Union City, Pa.: F. B. Camp can furnish particulars regarding proposed extension of mains.——Clayton, Del.: The Clayton Water Light and Power Co., has been incorporated; capital, $50,000.——Lynchburg, Va.: Two 2,000,000 and one 3,000,000 gallon pump, with the necessary boilers will be put in. J. B. Page is superintendent.——Columbia, S. C.: Water bonds to the amount of $75,000 have been sold.——Pell City, Ala.: The project for works has been revived. A company is proposed.——Uniontown, Ala.: Bonds for new works will be issued to the amount of $25,000.——Address J. C. Welch, Mayor.——Noblesville, Ind.: The Noblesville Water and Light Co. has been incorporated by J. R. Christian, W. N. Evans and others, with a capital of $50,000.——Bay City, Mich.: E. L Dunbar, Superintendant, can furnish information in regard to proposed extensions. A 50-inch main is to be laid through the business part of the city.——Essex Center, Mich.: The people have voted to build $25,000 works.——Litchfield, Ill.: A project is on foot to furnish a new water supply to the city. Address J. C. Edwards or Eli Miller.——Taylorville, Ill.: About 60 tons of 4-inch pipe will be bought to replace wooden pipe.——Peru, Ill.: It is proposed to put in two 1,000,000 gallon compound duplex pumping engines, a water tower and 9 miles of mains.——Grinnell, Ia.: Drive wells are proposed.——Owatonna, Minn.: The mains will be extended.——Armour, S. Dak.: 1,080 feet of 6-inch pipe will be laid.——Flandrau, S. Dak.: Works will be built at a cost of $10,000.——Livingston, Mont.: An extension of the mains and ten new hydrants have been ordered.——Cameron, Tex.: Works are proposed.——Dallas, Tex.: The city will issue $100,000 of water supply bonds.——Colorado Springs, Colo.: The Brookside Water Co. has been incorporated by M. A. Foster, John Wolfe and others.——Aberdeen, Wash.: $65,000 in bonds will be issued for the construction of water works.——Portland, Ore.: Address J. P. Howe in regard to a proposed water supply for Portland Heights.——Georgetown, Ont.: The people have voted to build works.——Mt. Vernon, Wash.: Complete works are proposed.——West End, Ga.: A complete system of water works will be built.——Elkhart, Ind.: Address C. A. Sharpe, secretary, for particulars concerning improvements to be made in the water system.

BIDS AND CONTRACTS.

Lynchburg, Va.: Bids are wanted for two 2,000,000 and one 3,000,000 gallon pump with necessary boilers. Address J. B. Page, superintendent.——Peru, Ill.: Bids are wanted until June 6 for two 1,000,000 gallon compound duplex pumping engines, a water tower and the furnishing and laying of about 9 miles of mains. Address T. Gruelich, Mayor.——Armour, S. Dak.: Bids for 1,080 feet of 6-inch pipe and laying same will be received until June 2, by E. R. Wanzer, Town clerk.——Warsaw, N. Y.: Bids are asked for the construction of the first section of sewers.——Kearney Township, N. J.: Bids are invited for two lines of sewers. Address Township Committee.——North Yakima, Wash.: Proposals are invited for sewers until June 15. Address F. M. Spain, city clerk.——McPherson, Ga.: Bids for erecting officers quarters are opened until June 13. Address Capt. J. W. Jacobs, U. S. A., Atlanta, Ga.——Norfolk, Va.: Bids for the erection of a county court house and jail are open until July 27. I. H. Harn is Clerk of the Board of Supervisors.——Harrodsburg, Ky.: Until June 15, sealed proposals will be received for the erection of a system of water works. Philip T. Dednear and C. E. Clark are the committee.——Orange, N. J.: Proposals for 103,000 feet of pipe sewers and 11,000 feet of brick sewers will be received until June 8. Horace Stetson, city clerk, may be addressed at 238 Main street.

SUNDAY IN THE COUNTRY.

Commencing Sunday May 24th, and regularly each Sunday thereafter during the summer season, the Wisconsin Central will run a Sunday Excursion train between Chicago and Waukesha, making stops at all intermediate stations, leaving Chicago at 8:30 A. M., and returning, arriving in Chicago at 8:30 P. M. Commencing Monday the 25th, and regularly each Monday thereafter during the summer season, a train to be known as the "Business Man's Special" will be placed in service from Waukesha to Chicago, leaving Waukesha at 5:30 A. M., and arriving in Chicago at 9:00 A. M. These trains, with the regular service on Saturdays leaving at 3:00 P. M., 4:25 P. M., and 5:00 P. M., make it possible to spend the day in the charming lake region in Northern Illinois, reached by the Wisconsin Central, and return in time for business Monday morning.

For detailed information as to intermediate time, excursion rates, etc., apply to Geo. K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or F. J. Eddy, Depot Ticket Agent, Harrison street and Fifth avenue, Chicago, Ill.

THE MASTER PLUMBERS.

If you are going to attend the meeting of the Master Plumbers in Cincinnati in June don't forget the Old Reliable and justly popular Big Four Route, running the finest trains and being the only line from Chicago that lands passengers in the Grand Central Station, Cincinnati. Reduced rates will be made for the meeting. Address for rates, etc., J. C. Tucker, General Northern Agent, 234 Clark street, Chicago.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.
* * * *
But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

The returns of the census just completed show the population of the Indian Empire to be 285,000,000, being an increase of fully 30,000,000 since the last census, taken in 1881.

THE SANITARY NEWS

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—AT—

No. 90 La Salle Street, - - - Chicago.

OFFICERS:

ANDREW YOUNG, President.

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We do not know how far the influence of Chicago has gone, but since this city has tried practical plumbers for plumbing inspection, many other cities are advocating the same measures. The sentiment in favor of plumbers in this position is spreading rapidly.

Cincinnati will know more about plumbing and its importance after the convention than ever before.

Public and official recognition of the value of good plumbing to health would be a strong factor in the promotion of this important interest. Officials the same as the public must be educated in this matter.

The cities generally throughout the country are giving increased attention to sanitation. The disposal of garbage, street cleaning, purification of water, and the smoke nuisance are all receiving consideration. There seems to be a general spirit of reform all around. The signs are quite healthful.

The question of the disposal of sewage is receiving a new impetus in the way of discussion. The disposal by waterways is being more strongly condemned, and disposal by artificial means advocated. The truth will come eventually that pure water cannot be obtained from streams into which sewage is emptied. Dilution is a delusion and a snare. Some other means for the disposal of sewage will come as one of the extremest necessities and will come soon.

CUTTING PRICES.

There is nothing more demoralizing to any business than the custom of cutting prices, under-bidding, and unfair rivalry or competition. This is as true in the plumbing business as in any other, and the result is more serious. In the first place plumbing work is worth its price and well worth it. There is no need of lowering prices on plumbing work. They are low enough. They have been adjusted to the general business of the country and are in harmony with the general tenor of business in other lines. The plumbers cannot afford to do work for nothing or for prices that leave them no profit. Their money, time, experience and skill are all invested and should return a fair profit. If they do not, the plumber has not received his dues and there is something wrong somewhere. If this be the result of cutting prices among members of the craft, the evil should be remedied at once and a fair rate of prices established and maintained. There is no need for suicidal rivalry or disasterous competition. There is nothing in the business that demands or requires it. It is a legitimate, highly honorable and useful business, and its dignity and respectability should not be lessened by any reduction of prices or ridiculous or ruinous competition. The plumber's motto should be, do good work and charge good prices. All should agree to that, and stick to it. There is just so much plumbing to do, and good prices will not make less or low prices make more. The work is to be done, and the only rivalry or competition that should come between plumbers should be that of skill and good workmanship. A plumber can afford to do less work for more money better than more work for less money.

There is another reason why cutting prices should be disfavored: Its results as affecting public interests should be taken into account. Under-bidding and lowering fair prices has a tendency to result in inferior material and work, and this will produce evils affecting the public well-being, and create a menace to health of a far-reaching and serious nature. People who wish plumbing done should remember this and pay plumbers enough so that they can afford to furnish the best material and do the best work. In truth, all interests should conspire to secure good plumbing. Besides, it is not good business to cut prices. It disorganizes everything and breeds an uncertainty that is fatal to business prosperity. Do good work and set prices which will yield a fair profit. Furthermore, if a plumber place a low estimate on his work the people will soon do the same, and he will always be considered as a second or third class plumber.

A medical exchange gives some advice to doctors on this subject which we wish to quote to plumbers. It says:

"Let the first doctor who gets to a new town decide, by all the circumstances which he observes, what will be a fair fee for the

people to pay for a physician's services. The next man who enters the field should compete with him fairly and squarely, and charge the same fees. If these men are just and competent, they have established fees for that town for a long time to come. Others may come in and underbid them, but that will make no difference if these men have the confidence of the people. The lower charges will flavor of inferior service, and the community will look askance at the man who charges them. No good man, competent and qualified, will put a low price upon his services.

"There is a constant growing tendency in rapidly-growing cities for the prices to be gradually reduced. This must be constantly watched by every individual physician, and guarded against. Keep the prices up. There is actually no learned profession to-day more poorly paid than the medical profession, for the actual responsibility of the services rendered. In no other secular profession are there more poor men. It is a very rare thing indeed to find a man who has become rich in the practice of the medical profession, even when he charges full prices."

This is as good advice to plumbers as it is to doctors and aptly applies to their case. It is a mistake to undercharge. Maintain the prevailing prices. They are low enough. Fortunes are not being made fast where the best prices prevail, and no plumber is robbing his clients. Plumbers should not degrade their work by lowering prices. People value what they buy largely by the price they pay for it, and plumbing is no exception to the general rule. It may not be in every case that the man who charges most does the best work, but the chances are largely in his favor, and the people understand this thoroughly. Plumbers bear a great responsibility, and their remuneration should be commensurate therewith. It is too honorable and important a calling to be degraded by reckless reductions of charges.

CHEAP LODGING HOUSES.

The problem which the cheap lodging houses present to the health department is not an easy one to solve. That these houses are filthy, illy kept and the source of disease and the spread of contagion, there can be no doubt. The question is, how can the evil be remedied? It is hardly presumable that all the evils springing from these lodging houses can be suppressed at once if ever. The rumor that they were to be closed is probably incorrect. We do not believe that such measures will be enforced. It would not abate the evil, but would add others thereto. The central points where the evils now exist would very probably become several sources of the ills now existing. There is a demand for these lodging houses, and this demand will be met in some way or other. There is a class of people which must resort to these cheap places for lodgment or remain on the streets. These persons must house themselves in accordance with their means or not be housed at all. To close the places which are within their means against them and force them to streets, courts and hallways would increase the evil and greatly endanger health, life and property.

Fortunately these evils can be greatly lessened without closing the lodging houses. They can be kept clean. They may not be made luxurious and comfortable, but they can be made healthful. No man has a right to perpetuate anything that is a menace to health. If a house be so situated that it cannot be made healthful as in an unventilated basement, it should be removed and that place closed. But where the location will permit of healthful conditions, these conditions can be secured and should be maintained. The health department has the power to compel these houses to be kept in a thoroughly sanitary condition, and a strict enforcement of the law under intelligent direction will greatly lessen the evils now existing. It is almost necessary that some such places should be offered a certain class of lodgers, but there is no reason why the houses should be kept in an unsanitary and foul condition. It would not be a great tax on the keeper to maintain cleanliness, and if the health department set about the matter in the right way there will be but little trouble to put these houses in a condition of healthfulness. The matter of contagious diseases of course is to be considered, but can the danger be greater in houses than upon the streets? It is simply a matter of regulation and not suppression. Let the houses be renovated and disinfected at stated intervals and kept in a cleanly condition, well ventilated, and the evils will largely disappear.

NOTES AND NEWS.

At its recent convention in Pittsburg, the name of the National Association of Machinists was changed to International, to cover the widening scope of its membership.

According to a scientist, the hourly rate of water falling over Niagara Falls is 100,000,000 tons, representing 16,000,000 horse power; and the total daily production of coal in the world would just about suffice to pump the water back again.

Coal is scarce and high in the Argentine Republic, and many of the locomotives of the Argentine Great Western railroad are being fitted for the use of petroleum as fuel, and it will probably supercede all other fuel on that road. The oil used is a heavy petroleum found at Mendoza, near the line of the road, which answers the purpose of fuel fairly well, although it has been found impossible to refine it so as to make a good lamp oil. The economy is very considerable as the railroad company can procure this oil at present at a cost of $12 paper per ton—equivalent to about $3 gold—while English coal, which has been used on parts of the line, costs $20 gold, per ton.

"In reference to technicalities," says Dr. James Truman, "there is a certain class of scientific men who, in their dealings with their special work, so overload the matter with technical terms that they can never be clearly understood, even by those equally advanced as themselves."

In families where there is much sewing to be done, it is a good plan to have the bulk of work on dark and colored goods done by day-light, preserving the white sewing for the evening, in order to save the eyes.

Among the wealthy the whirl of society, late hours, rich food, and neglect of physical exercise, breed indigestion and its attendant ills, and art is called upon in vain to repair or cancel ravages due to defiance of natural laws.

An International Hygienic Exhibition will be held in the months of January and February, 1892, in Leipzic. The exhibition will comprise, among others, sections devoted to hygiene, foodstuffs, and ambulance.

A French journal states that the refiners of petroleum—those especially who clean out the apparatus which has been used in the final rectification—are subject to a peculiar skin disease resembling the cancer of chimney sweepers.

It has been reckoned that if the whole ocean were dried up, all the water passing away as vapor, the amount of salt remaining would be enough to cover 5,000,000 square miles with a layer one mile thick.

An automatic life-saving belt has been tried in the Thames. It can be screwed up like a ball and fired from a cannon or thrown by hand, the belt righting itself by contact with the water.

Cork covering for steam pipes has proved very successful in England, and in some cases it has been found to make a difference of 100 to 124 degrees from the temperature of uncovered pipes.

In a recent report of boiler inspectors, out of more than 5,000 boilers examined in one month, 10,000 defects were discovered, nearly 800 of which were dangerous, while 33 boilers were found to be unsafe for further use.—*The Safety Valve.*

The British Board of Trade, after a careful investigation of recent boiler explosions, have unanimously concluded that rigorous inspection only will prevent their recurrence. Parliament is, therefore, asked to make inspection compulsory.

Charles Henderson, of Titusville, Pa., has made an important discovery that he claims will reduce the cost of steel for steel tools from 40 cents to 4 and 5 cents a pound. This process makes it possible to use the ordinary soft machine steel for all kinds of tools, rendering them equal to high grade silver steel for all kinds of work. There is no breaking or flaws in the tempering.

A method of blasting by electricity has been tried in Sweden, says the *Electrical Review*, with good results. The means consist of a voltaic arc produced between two carbon rods placed parallel. When the arc is moved close to the spot to be blasted an intense local heat is created, resulting in expansion that splits the rock.

ANNUAL REPORT OF CHIEF TENEMENT, FACTORY, AND SMOKE INSPECTOR

(For the year ending December 31st, 1890.)

To Swayne Wickersham, M. D., Commissioner of Health.
Sir:—During the year 1890 there were examined 7,478 new buildings in course of erection, and plans were filed for 5,783 new buildings. This work is done by ten plumbers, who are specially detailed from the total number of 34 inspectors.

Complaints were made of 11,864 houses and premises, and 4,452 other houses were examined, containing altogether 21,816 families with 123,240 persons.

23,333 work places were visited where 260,843 persons are employed. 12,925 notices were served to abate nuisances, and 12,650 were abated, including the following:

Defective Plumbing	3,200
Defective Drainage	1,460
Offensive Catch-basins	950
New Sewers	520
Traps Applied	3,250
Plumbing work ventilated	883
Rooms and Work-rooms ventilated	353
Leaky Roofs Repaired	186
Privies Cleaned	4,290
Privy Vaults Abolished	60
New Water-Closets Constructed	283
Yards and Premises Cleaned	2,061
Miscellaneous,	894

This statement of improvements effected does not include the notices issued to plumbers on account of new work in houses during construction. The plumbing rules and regulations are enforced as far as the city limits can be covered by ten practical plumbing inspectors.

Suits for 1890.

New Building	5
Defective Plumbing	23
Leaky Roofs	6
Full Vaults	17
Defective Drains	13
Filthy Premises	4
Miscellaneous	6

10 cases Defective Plumbing, Fines $1,200; $75 on the above. Total $1,275.

In previous reports I have directed the attention of the Common Council and the public at large to the necessity of providing means for preserving the health of the city by the prevention of public nuisances. To that end an ordinance was presented to the Common Council at my request, declaring as a nuisance the erection or maintenance of a privy vault on any lot fronting any street or alley, avenue, boulevard or place which has a public sewer fronting such lot. No action has yet been taken upon this recommendation, and the existence of these sinks of filth is a constant menace to the health of our citizens. I desire again to call attention of the authorities to the necessity of abating them. There is no excuse for their existence where sewers are convenient, and besides being dangerous to health they depreciate the value of surrounding property. Means must be employed, sooner or latter, to abate these nuisances, or the consequences may be direful and disastrous.

Our city has long been famous for its many conveniences for conventions and other large gatherings of the people, and in many other respects our facilities for the pleasure and comfort of strangers are unsurpassed; but in one respect we are sadly lacking: in the whole city there is not a public urinal or sanitary, and not only strangers but our own citizens are compelled to either use the alleys or enter some private store or saloon.

Many a person feels it incumbent upon himself to pay for the convenience thus afforded by patronizing the house; thus paying dearly for a convenience that, in other cities, is very properly furnished by the community. This is a species of extortion, indirect though it may be, that should not be permitted. The condition of our alleys in many localities call loudly for a reform in this direction, and the matter should receive the early attention of the city authorities.

Some of the demands made by one of our local party conventions are deserving of the early attention of the Common Council. Among these may be mentioned a demand for public baths under control of the municipal government; that the number of building and sanitary inspectors be increased to such extent as will meet the requirements of the building and health departments, and such other ordinances as will protect all workmen against accident or disease while at work from improperly constructed and ill ventilated buildings. Such changes as may be necessary in order to carry out these suggestions need not be expensive, and can be complied with without entailing hardship upon any of our citizens, while the resulting benefits will be far-reaching and pregnant with good to the city at large and all permanent or transient sojourners.

Many of the existing defects in the plumbing or drainage of our residences and public edifices are due in large measure to the neglect or inefficiency of former inspectors. We have found entire rows of blocks with sinks that had never been supplied with traps, and there were thousands of costly residences whose waste-pipes and soil-pipes were not ventilated. The present officers of the Health Department have endeavored to correct, as far as possible, the faults of construction is these buildings, and generally with satisfactory results.

It has been the aim of this department to conserve as far as possible the health of all classes of the community. Both the means and the authority have been lacking in many instances, yet such as we have had at our disposal have been impartially employed for the good of the entire community without distinction of persons. It is essential that these means be perserved in until such time as perfect sanitation be secured within our borders, whether in the habitations of the rich or the poor—the high-born or the lowly. Such reforms can be instituted provided the necessary power is granted to this department, and it is to be hoped that where so much is at stake—when preventive measures now will do away with the necessity for far more expensive curative measures in the future—the comparatively trifling expenditure so essential to our city's welfare will not be withheld, and that no niggardly hand will dispense the necessary means towards securing so desirable results.

In my report for the year 1889, attention was called to certain rules formulated by this deparment governing the drainage and plumbing of new buildings. These regulations have been enforced rigidly as far as circumstances would permit, and with the most gratifying results. There has not been a single complaint of the presences sewer gas in any residence or business building constructed and drained in accordance with these rules, and the general health of the occupants had been uniformly good, the absence of malarial and zymotic diseases being most marked, I regard it as desirable, if not imperatively necessary, that the department continue to enforce these regulations in all buildings hereafter constructed, feeling confident that the results will more than compensate for the additional cost and trouble involved.

One difficulty under which this department labors is the fact that few of the inspectors are practical builders or mechanics, and consequently are not fully qualified to discharge the duties of their positions. Defects in the construction and plumbing of buildings are frequently overlooked, and discovered only after disease has fastened its poisoned fangs in the human system, and the grim messenger, Death, has summoned some loved one to that bourne whence no traveller returns. The employment of inspectors possessed of a knowledge of a science of sanitary engineering would obviate many of the difficulties with which this department has to contend, and greatly promote the healthfulness of our city. I would recommend, therefore, that applicants for place as sanitary inspectors be required to pass an examination before a board of competent sanitary engineers, to the end that the best interests of the municipality and its inhabitants may be subserved.

Much may yet be learned by modern sanitarians from a study of the methods employed by the ancients for the cleansing of their cities. Rome, after the lapse of twenty-five centuries, still enjoys the advantages of a system of drainage designed and put into operation seven hundred years before the Christian era. The Persians, and the ancient Hebrews, paid particular attention to the cleanliness of their homes, and to their purification from all offensive odors. The Greeks, also, had special

provision in their houses for the reception and disposal of all excretions, and the ancient cities of that country were models of cleanliness, and their inhabitants superior to those of all neighboring nations in manly strength, vigor and courage, and womanly loveliness. We can profitably imitate the methods of these ancients, supplementing them by such modern appliances as have been proved to be effective, and make of Chicago one of the cleanliest cities on the globe.

For some years past, complaints have reached this department relative to the treatment of women and girls, employed in our retail stores and large manufactories, received at the hands of their employers. Inquiry was instituted, and sufficient facts elicited to prove the existence of abuses that should be rectified. The ladies employed as inspectors by the department made a thorough canvas of the mercantile and manufacturing establishments of the city, and found that the complaints were only too well founded. Women and young girls were frequently compelled to stand for hours at a time when such hardship was not necessary to a proper discharge of their duties. The dressing and retiring rooms were also found to be, in many instances, in an unsanitary condition. Upon proper notification a majority of the employers took immediate steps to rectify the defects complained of, and have since striven to maintain thorough sanitation. The result is apparent to even the most casual observer by the increased bouyancy that marks the appearance of our working girls upon the streets. The sallow hue of disease has given place to the bloom of youth, and the elastic step of the shop-girl as she treads homeward, merrily chatting, meanwhile, with her companions, is gratifying change from the sad and oftentimes mournful trudging from a laborious day's labor to a cheerless home. The improvement in the physical condition of the working women has made their services more valuable to their employers, and as a consequence, they are better compensated than formerly, when disease, fostered by miasmatic effluvia, almost invariably got the upper hand of the exuberance of youth or the mandates of necessity.

The request of this department, that shop-women and others engaged in diverse branches of industry be provided with seats, has been generally uncomplainingly complied with. Results have satisfied employers generally that the law was a wise one, and as a consequence we find that it is a rule in all our large establishments to provide for the comfort of the female employes. Their dressing-rooms are comfortable and well ventilated, though in some instances too circumscribed as to space. But the improvement during the past half decade is so marked that it cannot have failed to attract the attention of even the most superficial observer.

Too much credit cannot be bestowed upon the ladies who have had supervision of this part of the city's sanitary work. They have proved themselves vigilant, and indefatigable. Their heart has been in their work, and they have permitted nothing to escape them which, even in a remote degree, affected the welfare or the physical well-being of their sisters compelled to labor for an honest subsistence. That their efforts have met with such pronounced success is no less a tribute to their industry and zeal than to the happy concatenation of circumstances which vests authority in officers of the law to enforce enactments that are too often allowed to remain as dead letters upon the statute books, and imbues the officials with a desire to enforce those laws whenever they shall conduce to the public good.

In order to satisfy myself of the actual condition surrounding children employed in stores and factories, I took the names and residences of quite a number, and followed them to their homes. I submit a few examinations from a number taken by my officers:

Case Number Three.—German family; in comfortable circumstances; own their own home; father employed; older children at work and taking music lessons; girl twelve years old employed in paper-box factory; Compulsory Education Department will not grant permit hereafter.

Case Number Four.—German family; girl very small, but received assurances that she was fifteen.

Case Number Five.—Polish family; a girl twelve years of age, employed in burial shoe factory—very light work; father not regularly employed in winter; seven children; girl attends night-school since investigation.

Clara M. Doolittle.
Ida J. Sullivan.

In presenting this record of work done for the past year, and the results attained, I would be ungrateful did I fail to mention the earnest and cordial support given my efforts by his honor the Mayor, Commissioner Swayne Wickersham, the Law Department, and my own officers. Through our united efforts, Chicago has established a sanitary code of laws, rules and regulations in keeping with our city's progress.

"After a hundred years of commercialism we have learned to breathe dirt as well as to eat it," says a writer in a recent issue of *Macmillan's Magazine.* The same assertion is true in a modified degree as to the denizens of Chicago. Long familiarity with smoke and soot has bred indifference to them, if not the proverbial contempt. The effects, however, are visible on every hand in pallid faces, faltering steps and decrepit forms. A lack of vitality is seen on every hand. Lassitude has usurped the place of energy, and in many instances enterprises, starting forth with the vigor and enthusiasm of a fresh revelation, has relaxed its hold and degenerated into a simple reminiscence.

The smoke plague in London has long been an incubus upon the municipality. Climatic conditions have assisted in perpetuating it, but those conditions do not apply to American cities, and more especially to Chicago, where the morning and evening breezes dispel the noxious vapors generated during the day to a very considerable extent. The fact remains, however, that this city is afflicted in a very large degree with the smoke nuisance. The pure air of heaven, wafted over the broad expanse of Lake Michigan from the east, or carried over the broad prairies of the south and west, becomes contaminated, and when inhaled into the lungs produces physical results prejudicial to the public health and well-being.

But the evil effects of a system that tolerates the smoke nuisance are not confined to physical conditions; they effect the moral and intellectual standing of the community. Sydney Smith once said that a filthy man can never be a moral man. Neither can a city or a community, enveloped in smoke and dirt, be a prosperous place. A few may reap rich harvests from the toil of the many, but squalor will perch upon every gate post, and poverty keep watch and ward at every window and door of the mass of the people.

The evils which flow, directly and indirectly, from our present system, or want of system, are too numerous to mention. They are beyond monetary calculation. They affect the adult population, but more especially the rising generation. They shadow the lives of the young with a blight that can never be removed. They render the closing days of the aged less endurable by accumulating upon their heads ills from which they should be exempt. The all-pervading smoke permeates every home and saturates the air we breathe, the water we drink, and the food we eat. The most sacred precincts of every home are defiled; the very founts from which infancy draws its sustenance are polluted.

In many of the manufacturing districts of England the density ot the smoke has obliterated the beauty of the sky. The sun is seen only through a haze of dense blackness; the stars twinkle unseen by the unhappy inhabitants of the earth beneath them. For many miles around London the same is true, while at other large manufacturing centers the same conditions exist. "That last fringe of the sky," says the writer, "the most delicate in its coloring, the most suggestive in its beauty—whether in the clear midday, when it descends dappled with lessening groups of fleecy clouds, paler and paler to the utmost limits of sight; or when at morning or evening it palpitates with green and gold flame-tints; or in winter when it glistens white with the reflection of distant snows—that last fringe, with all its wonderful suggestions and meaning, is hidden from us by the least traces of smoke. When this comes the gods depart; the divine message of the landscape passes away, and we see the trees and hills—but nothing more."

Little can be added to that which has already been said upon this subject. The smoke issue is a present and a pressing one in this city. Much has already been done to mitigate the nuisance; much more needs to be done. I hope the city adminis

tration will not only approve what has been done and the measures now in progress looking towards the lessening of the evils due to this cause, but take a stride forward, and by radical measures rid the city of an evil that can find no excuse for existence, and thus conduce largely to the physical beauty of the city and the general welfare.

SMOKE.

The following embraces the work done by this branch of the Department of Health, commencing March 30, 1890—at which date I assumed control of this branch—and ending December 31, 1890.

This branch of the Department of Health has accomplished more work and achieved better results in the suppression of the smoke nuisance, than has been accomplished in any previous year—and that without any special appropriation—as the following table will show:

Violations Observed	3,215
Notices Served to Abate Nuisances	2,189
Nuisances Abated	746
Suits Prosecuted	485
Cases fined $ 50 and Costs	299
" " 100 " "	1
" " 25 " "	1
" " 20 " "	1
" " 5 " "	1
" Dismissed on Payment of Costs	174
" " without cost	7
" Found Not Guilty	1

For amounts collected in these cases see reports of the Law Department.

This by no means shows all of the abatements. In many cases law-abiding citizens have voluntarily abated the nuisance—of which we have no record—influenced, no doubt, to such action by the determination we have exhibited in vigorously prosecuting all violations of the law. Credit should also be given to a number of our citizens who have abated the nuisance after being served with but one notice of violation, thereby evincing a desire on their part to co-operate with this department.

During the past nine months it has been demonstrated beyond any doubt—as a very decided change in our atmosphere bears witness—that the smoke nuisance can be abated. With careful firing in connection with one of the effective smoke devices now in the market, there can be no valid excuse for emitting dense smoke.

In connection with this I also wish to state that my efforts in the suppression of this nuisance have likewise proven beneficial to the owners of steam plants; because it has induced the engineers and firemen to be more careful in stoking their furnaces. They have come to understand that by frequently replenishing their fires with smaller quantities of fuel, instead of crowding their furnaces at long intervals, they cause better combustion, less smoke, and a reduction of the coal bill at the end of the month.

Although not as successful with the different railroads operating in the city as with the stationary plants, yet we have made remarkable progress, and reduced the volume of smoke emitted from the locomotive engines to a considerable extent, and there is no doubt that, if persistently followed up, the nuisance created by them can be as successfully abated as has been done on stationary plants.

The efforts we have made and the work accomplished has been more far-reaching than we anticipated. Through the publicity given this subject by the local press, it has been taken up and agitated by a number of the papers in many of the prominent cities, and on account of such agitation, has caused the heads of departments in many of the principal cities to correspond with this department, requesting a copy of our ordinance covering the smoke nuisance, and asking for information in regard to our *modus operandi* in abating this nuisance.

The thanks of this department are due the press of this city as their share of the credit attributed to this department in the suppression of the smoke nuisance, for their agitation in this matter, and the support they have given me in the daily papers.

In conclusion I can only say that a vigorous enforcement of the law will abate the smoke nuisance.

SUPPLEMENTARY REPORT ON RAILROADS.

There is no longer any doubt of the practicability of abating the smoke nuisance on railroads, as is shown by the following report of what has been accomplished by the roads running into the city during the past year, beginning with March 1st, 1890. The Chicago and Northwestern has abated the nuisance on 64 locomotives and 16 stationary boilers in their depots, office buildings and shops; the Pittsburg, Chicago and St. Louis on 18 locomotives, one boiler in their shop, and have contracted to equip all other engines running into Chicago. The Lake Shore and Michigan Southern have equipped 68, and that number comprises all their locomotives running into the city including passenger, freight and switch engines. The Chicago and Rock Island have equipped 24 locomotives with new devices and repaired 36 old ones, some of them having been in use for the past six years, and have equipped the boilers on their elevators "A" and "B." The New York, Chicago and St. Louis equipped 8 locomotives, and contracted for 10 more that will cover all the engines this road has running into the city. The Chicago and Erie have equipped 18, and have assured this office they will continue the good work until all their engines running into the ciry stop their smoke. The Chicago and Grand Trunk are now engaged equipping all their engines running into the city, have 7 equipped and have promised to finish them all before summer. The Belt Road equipped 3 locomotives and the boilers at Dearborn Station. The Chicago and Eastern Illinois have equipped 9 new and repaired 10 that have been in use for several years. The Baltimore and Ohio have all their engines equipped running into the city, 35 in number, and report themselves highly pleased with the results. The Illinois Central have succeeded in stopping their smoke on 12 of their locomotives and promise a complete abatement in the near future. The Michigan Central are engaged upon 39 of their engines running into the city: have 13 of them all ready and working satisfactorily. These results are very satisfactory to this department, and establish beyond a question that it is practicable to abate the smoke nuisance.

Many of the other roads running into the city have made experiments during the past year, but have reported little progress and a good many failures. This department has decided that sufficient time has been given to those who have not yet complied with the ordinance, and a vigorous prosecution will be commenced against those who have neglected or refused to comply. Much more has been accomplished in abating the nuisance in factories, hotels and office buildings, a report of wnich will soon be ready for publication.

Respeetfully submitted,

ANDREW YOUNG,
Chief Tenement, Factory, and Smoke Inspector.

CONVENIENT TO HAVE ABOUT.

To keep lemons, put in a glass can and cover with cold water, changing the water every week.

The comparative rates of expansion of copper and iron are copper 3, iron 2; while the heat conducting power is in the ratio of copper 6, iron 1.

Insoluble cement which is hard enough to withstand even boiling sulphuric acid is obtained by gently melting India rubber and adding 8 per cent. tallow while stirring. Sufficient slaked lime should be added to give the compound the consistency of a soft paste; twenty per cent. of vermilion is now added, which causes the mass to harden immediately.

A German paper, devoted to the interests of brewers, gives a method of detecting sulphured hops which may be useful in other ways. A knitting needle is fitted with a silver-plated knob and is driven into the bale of hops so as to leave only the knob visible. If after two or three hours the silvered knob is blackened, the sulphuring of the hops is considered to be proved.

In connection with the equipment, for fire protection, of wood working establishments, *Fire and Water* recommends placing a gallon pail filled with fine sand within convenient reach of each workman employed where oiling and finishing. This practice

might well be followed wherever there is a possibility of fire starting in oil or oil-soaked materials. There is nothing which will squelch an oil-fed fire in its incipiency more quickly and effectually than sand; and there are no afterclaps in the way of water damage, either.

To remove ink from paper, if not of too long standing, wet a teaspoonful of chloride of lime with just sufficient water to cover it. Pat, not rub, the spot gently for a few moments, using a soft cloth with the mixture, and then the ink will slowly disappear. If one application is not sufficient, try a second.

To clean sheets of wrought iron, etc., the plates are pickled in hot dilute of sulphuric acid in the ordinary way; commercial oil of vitriol diluted with ten volumes of water being preferably used at a temperature of 200 degrees F. The improvement consists in allowing the contents of the pickling tank when sufficiently concentrated to flow slowly through a long cooling channel and there deposit the greater part of the dissolved sulphate of iron, the mother-liquor passing into a vessel from which it is continually pumped back into the pickling tank, vitriol and water being added till it is of the proper strength. The process is continuous on being fairly started. Cylindrical pickling tanks are used for cleaning wire.

Isinglass boiled in spirits of wine will produce a transparent cement which will unite broken glass so as to render the factor almost imperceptible.

It is sometimes convenient for an engineer to be able to approximate the amount of condensation that will take place in pipes during a certain length of time. From many experiments made on the condensation of steam in wrought iron pipes when exposed to the open air it is found that one pound and six ounces of steam per square foot of pipe surface was condensed per hour when the difference in temperature between the steam and air amount to 200°. As this is very nearly the difference of temperature usually found between the steam in the pipes and the air on the outside, this simple rule will give results sufficiently close for ordinary purposes.—*The Stationary Engineer.*

BACK VENTING.

St. Paul, May 28, 1891.—Editor The Sanitary News: In view of the fact that the National Convention of Master Plumbers will soon convene in annual convention in Cincinnati to discuss matters of interest to the trade, would it not be a good idea to bring up the question of back venting for practical discussion?

It is a well known fact that outside of the theorists and architects, who get their ideas from drummers, that no one interested in plumbing work has the least faith in the so-called vent system now in use. A great number of the practical men in the business with whom I come in contact scoff at the whole system of venting as at present practiced. I know of a rule in force in St. Paul where the plumber is required to put in a trap screw over the crown of trap in the vent pipe that serves it, for the purpose of cleaning out the vent when it gets stopped up. Is not this evidence enough that no dependence can be placed on the "vent?"

I would like to see this question fully discussed from a practical stand point, and I think it would be of more interest than any other discussion that might take place.

I see the Sanitary News at the Master Plumbers' rooms here and I must say I enjoy reading its contents with the exception of its poetry, and if you will permit a suggestion from a well wisher, kill that "poet" before he brings the paper into National disrepute by the silliness of his effusions.

Yours truly, Anthony Vallentine.

[The plumbers throughout the country can judge as to how truly Mr. Anthony Vallentine represents the sentiment regarding venting. Mr. Anthony Vallentine may know a great deal more about venting than everybody else, but when it comes to his knowledge about editing papers he is away off. If Mr. Anthony Vallentine knew anything about newspaper business at all, he would know that poets cannot be killed. They never die. If they were not immortal, they would have starved to death long ago. We have tried hard to kill The Sanitary News poet, but we can't do it. However, to oblige Mr. Anthony Vallentine we will try it again and force him to read the above communication. We, also, would like to see the subject of venting brought before the Cincinnati convention and an expression given regarding it.]

RULES FOR PLUMBERS.

A special meeting of the Board of Directors of the Street and Sewer Department of Wilmington, Del., was held recently to discuss the subject of rules governing the work of drain-layers and plumbers doing business in this city. In addition to the three directors of the department there were present: T. Chalkley Hatton, engineer-in-charge of sewers; Edward F. Kane, plumbing inspector; Francis McCloskey, street commissioner, and Chief Engineer George H. Boughman.

Engineer Hatton had prepared a series of rules in accordance with the recent act passed by the Legislature giving the department the right to make such rules.

The rules prepared provide that each drain layer or plumber who lays drains must before engaging in business take out a license from the department. He at once makes a deposit of $25 to cover the cost of making any repairs to pavement or street in case the drain layer fails to do such work properly. He must also give to the department a bond for $1,000 to save the city from damages, and must also, before opening the bed of a street, sign an agreement saving the city harmless for any damages that might result from his carelessness.

The rules also provide that no person shall connect with sewers unless a duly authorized agent of the board shall have approved the work. No one is allowed to tear up the sidewalk of a street without a permit, and must make all arrangements possible for the convenience of the public.

The rules further provide that no solid matter from closets or manufacturing establishments shall be dumped into a sewer unless the same is at the same time flushed with clean water. A violation of this section is a misdemeanor and is punishable by a fine of not less than $10 nor more than $100. It is also unlawful for any manufacturing establishment to blow steam into a sewer. This last precaution is taken to prevent sewers from being damaged in that way, as they have been in the past.

The remainder of the rules are about the same as those now enforced by the plumbing inspector. Though the rules seem cast iron they are modelled on those in use in other cities and are considered to be needed. Plumbing Inspector Kane is now an officer of the Street and Sewer Department and will enforce the new rules.

DECORATION DAY.

BY ANDREW YOUNG.

Comrades: There are moments in our lives when the subject is so grand, the occasion so memorable, that neither pen nor tongue, however eloquent, can fittingly portray the feelings of the hour. And to-day, as we look into each others eyes, our minds carry us back to thirty years ago, when the blood coursed swiftly through our veins; when with hopes and aspirations high, we offered ourselves a sacrifice if need be, that a government of the people by the people should not pass away from among the nations of the earth. Our offering was not made in vain; the sacrifice, watered by the tears of the widow and orphan; the soil enriched by the life blood of our brothers; that baptism of blood and carnage—its lasting fruits are with us in a free Republic and United States.

We meet to-day in numbers but a handful. Call the roll, sergeant. No answer from those who passed away at Camp Douglas. Then call the roll in the beautiful Shenandoah Valley. No answer save the rustling of the wheat and corn, or the lowing of the kine in the peaceful valley. Call the roll under the rugged, beetling crests of Maryland and Loudon Heights, and still no answer save the murmurings of the Potomac, as like a thread of silver it winds its tortuous way to the sea; on then to Kentucky and West Virginia.

Louder, sergeant, they are sleeping all along our way. Cattletsburg, Loutsa, among the wild defiles of Eastern Kentucky and Western Virginia. No answer. Then let us over the mountains to East Tennessee, Lenoir, Campbell Station, Knoxville, Strawberry Plains, Dandrige. The cold, the hunger, the attack and the repulse left a goodly number there, and still no answer. Let us on to Atlanta; the roll grows smaller. Back to bloody Franklin's

field. No answer. Pat Cleburne's gallant men are silent as our own to-day. No more the wild yell or the answering cheer. Back to Nashville and victory. Then on to North Carolina, Newberne, to Washington.

Arms aport. Break ranks. March.

HOW OTHERS VIEW IT.

The *Evening Wisconsin* looks at the matter of cleaning up Chicago for the World's Fair in this way:

The Chicago Real Estate Board has draughted and submitted to the Legislature a bill providing for the levy of a 3 per cent. tax in Chicago for general purposes, in 1892, instead of the reguler 2 per cent. tax. The idea is to levy the extra 1 per cent. of taxation for 1892 only, so that the extra $2,000,000 which it represents may be used to clean up the city in preparation for the World's Fair. The direct interest of the Real Estate Board in this matter is, of course, mercenary. The ostensible object is to put the city in such inviting shape that visitors will write and tell their friends about it, and thus aid in augmenting the attendance; but the real object, undoubtedly, is to prepare for the coming of people who have money to invest in real estate. With a clean city to back the arguments of the real estate agent, the harvest of commissions during 1893 ought to be larger than if the city is permitted to remain in its normal condition of dirtiness during the World's Fair.

Chicago ought to put herself in good sanitary condition during the World's Fair year; there can be no question about her duty in that regard. The experience of 1876 in overcrowded Philadelphia is a warning that should be heeded. Philadelphia is a much cleaner city than Chicago, but thousands of people took into their systems the seeds of disease while visiting the Centennial Exposition. Philadelphia suffered in sanitary reputation because of this, and Chicago will suffer likewise if she does not keep herself so clean during 1893 that her visitors may abide with her with safety long enough to see the big Columbian show.

And if the reputation of the city is dependent to a large extent upon its sanitary condition during 1893, and if it is a good investment to spend $2,000,000 in the cleaning of the city for strangers, why should it not be considered a much better investment to annually spend money enough to keep the city always clean? Of course Chicago people would sound the praises of their big city even though an epidemic were carying them off by scores; but if they had a clean and healthy city, and could drink their hydrant water safely without first submitting it to boiling heat, they could put honest spirit into their laudation. Chicago ought to have the Real Estate Board's bill amended so as to provide for an increased annual tax for cleaning purposes after 1892, so that when once they get their city clean they may keep it so. The annual expense after the first general clean-up would not be heavy, if the city ordinances are rigidly enforced.

ALL ABOARD FOR THE CONVENTION.

Chicago, June 3, 1891.—Editor of The Sanitary News: I have been waiting until the present time to get reports from our Essay Committee, and as yet have received no reply.

All Local Associations are invited to contribute Essays on any subject that they may desire for our next convention on the 23rd of June, 1891. It is hoped that our members throughout the country will take an interest in this matter and see that we are well supplied with essays, all of which will be referred to a committee before reading at our convention.

The Chicago delegation will leave their city on Sunday June 21, at 9:15 A. M. by the way of the Big Four Route, arriving in Cincinnati, at the Union Depot, at 6:15 P. M. They cordially invite all delegates and friends from the West and North-west to meet them at the Illinois Central Depot, at the foot of Lake street, and join them in their trip to Cincinnati. Special cars will be arranged for their accommodation. Those who desire to join them will please send information to headquarters mentioning what depot and what time they will arrive in this city, and arrangements will be made to have them taken care of.

Very truly,

Robert Griffith,
President, N. A. M. P.

FOR THE DIGESTION.

The worst all-around striker is the borrower.—*Pittsburg Post.*

Yes, Ruth, it is perfectly proper to speak of cigarettes as "the fouls of the air."—*Columbus Post.*

"Ed and Minnie had another falling out last week." "Serious quarrel?" "No; hammock."—*Washington Post.*

Even the clergy have their trials, but so long as they are only on account of heresy the clergy are not likely to complain—*Boston Transcript.*

A philosopher advises us not to hold the opinions of others in contempt. The easiest way to do this is to associate only with those who agree with us.—*New York Recorder.*

He—"Miss Sharp has a very fine voice." She—"No wonder. She grinds it so much."—*Detroit Free Press.*

It is only when he brings in his bill that the physician declares himself in favor of high heals.—*Washington Post.*

Earth has no other joy like unto that of the woman who has made eighteen calls and found everybody out.—*Elmira Gazette.*

It is something easier for a man to complete a round of pleasure than it is for him to make things square afterwards.—*Lowell Mail.*

Incandescents are a comparatively modern invention, but arklights were in use at the time of the flood.—*Westborough Tribune.*

Jack Witherspoon—"Why do you sing all the time?" Jim Westhall—"To kill time." Jack Witherspoon—"You have a good weapon."—*Princeton Tiger.*

We have had the Norwegian fad, the Russian fad, and now comes the Danish dramatic fad. Isn't it about time for the common sense brain fad to have its turn?—*New York Recorder.*

Weary Husband (Sunday morning)—"How long has that confounded bell been ringing?" Wife—"Since 6." Husband—"Well, I guess I'll go to church this morning and see if I can't get a little sleep."—*Life.*

Miss Plaineye—"How tenderly Mr. Thoughtful cares for his wife." Miss Caustique—"Yes; it would be terrible if she were to die before she inherited her father's fortune, wouldn't it?"—*Munsey's Weekly.*

Father (to physician) "You needn't prescribe any more appetizers for my daughter."

Physician—"Why, has her appetite improved so much?"

Father—"Well she don't seem to care much for ordinary edibles, but her private tutor was heard the other day to declare that she devoured every word he said."—*Pharmaceutical Era.*

Undertaker (to American youth who is lighting a cigarette)—"That's right. You smoke the cigarettes; we do the rest."—*New York Press.*

Fair Customer—"You say you trained that dog yourself. Can he understand me if I call him in English?" Dealer—"Yah. Off you whistle to him."—*Good News.*

"In your profession especially I suppose time is money." "I do not find it so," answered the musician. "I do not find it at all difficult to keep time."—*Indianapolis Journal.*

Jasper—"According to the fisherman Darwin's law of the survival of the fittest is duly exemplified." Jumpuppie—"Is that so?" Jasper—"Yes. The biggest fish always get away."—*New York Herald.*

Miss De Pink—"Did you hear about Miss Bullion's engagement to a foreign nobleman?" Mr. Goodfello—"Yes; everybody is talking of it." "Isn't it remarkable?" "Yes, indeed. They say she is marrying him for love."—*New York Weekly.*

Briggs (after the ball) –"Did you have enough to eat?" Brown —"No. Went down to the table four times, but there was a man there who was making such a hog of himself that I was ashamed to eat all I wanted."—*New York Recorder.*

Reporter—"How did your banquet go off, Banklurk?" Banklurk—"Not as well as it might, you know. The toastmaster called on a gentleman who had lost an eye, an ear, and a leg to answer to the toast, "Our Absent Members."—*Harper's Bazar.*

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

There are so many interests centering in the subject of smoke abatement that the least aid in the riddance of this great nuisance will be of value and prove a public benefaction. The evils of the smoke nuisance touch life and the wellfare of humanity in every phase of existence and occupation. The ills arising therefrom affect communities injuriously in every condition in which life is pursued. It poisons the atmosphere, contaminates food and drink, soils clothing and furniture, makes the day dismal, blackens cottages and mansions, depreciates value, and lessens the attractiveness of cities to enterprises, the investor, and the sojourner. Not only this, but in the abatement of smoke there is an incidenal good which, while not the prime object sought, is of much importance and value; that is the economy in the consumption of fuel arising from a more thorough and complete combustion, and the greater utilization of the heat force. To aid in the securement of these benefactions is the object of The Sanitary News.

The extent to which beneficent reforms, science, and inventive genius have been directed in the abatement of these ills is evidence that a great public evil has an every-day existence with us, and that it is worth our while to expend some means, time and labor in its eradication. To this end a department of this journal has been set apart to the discussion of the subject, hoping that public interest may be awakened, co-operation induced, and the best means to the end discovered, developed and utilized.

It has been demonstrated in this country and others that the smoke nuisance can be abated. It is no longer a question of doubt. It is an established fact, and there now remains the development of the most effective and economic means in the accomplishment of the object in view. This we do not believe lies in the invention of new fuel or the manufacture of new, yet research and experiment in this direction are to be encouraged. We believe the solution of the problem lies in the perfection of devices for the complete combustion of fuel. This is not outside the bounds of possibility, and is not dependent on the will-o'-the-wisp of glittering theories or the changing condition of seasons and place. It is to be accomplished in conformity with natural laws, in supplying the means through which these laws operate instead of placing obstructions in their way defeating that which nature attempts to accomplish. These devices appear in varied forms of construction, but the object sought is the same, the complete combustion of fuel. When we shall have arrived at that period in which perfect combustion is secured, or the results of partial combustion are consumed, we will then have solved one of the most important and immediate problems of the present day. That progress has been made in this direction, there are recorded proofs in the public press of the country. Our own city is not without evidence, and it has established the fact, through the material lessening of this evil, that it can be abated. The public are so directly interested in this matter that they should actively and continuously co-operate with the authorities in the abatement of this nuisance. Not only this but encouragement should be given to investigation, experiment, discovery and invention. Mechanical skill which has thus far so materially advanced the cause should receive proper inducements to pursue its course in the greater perfection of its inventions and devices.

A device has recently been put in operation in England which has for its purpose, not the combustion of fuel, but the prevention of the results of incomplete combustion from escaping into the atmosphere. This is accomplished by means of a chamber in which sprays of water wash down the suspended particles and retains them in a recepticle below. This is said to be very effective in arresting the evils of smoke, but it fails in an economic sense as the heat force of perfect combustion is not utilized and results in a waste of fuel and the energy necessary to operate the device.

What may be developed in the future cannot be conjectured. History proves that there is practically no limit to the possibilities of invention and the utilization of the forces about us, but at present it seems to have been established that the abatement of the smoke nuisance lies in the perfection of furnaces which will accomplish the object of perfect combustion of fuel.

REVIEWS AND NOTES.

A most interesting pamphlet of forty-two pages with numerous colored illustrations has been sent us by Harrison Brothers & Co., of Philadelphia, entitled "The Chemistry of Paints." The pamphlet contains a partial description of the extensive Harrison White Lead, Color and Chemical Works, setting forth in an entertaining manner the process of making paints, taking the raw materials and following them through the different processes to the finished article. Color making is also dwelt upon with interest and much information is given regarding this useful and beautifying necessity in the economy of building. Quite a portion of the work is devoted to a practical treatise on painting, containing a good amount of very useful information. This firm has long enjoyed the highest reputation, and its paints are known everywhere. Their guarantee of purity has been established through the quality of their paints, upon which their enviable reputation has been built.

Each number of *The Review of Reviews* contains some original article illustrating one or more live topics in the field of social, educational or political reform. The forthcoming June number contains an article by Mr. John H. Finley, Secretary of the New York State Charities Aid Association, upon American Reform in the Care of the Insane. It also contains an interview with the distinguished English liberal politician, Mr. Stansfield, upon projected reforms in the care of the poor in Great Britain. Other brief original features are an article by the Countess of Meath upon "The Little Sisters of the Poor" in France, and a sketch of a workingmen's co-operative colony called the Agneta Park, in connection with a large manufacturing establishment in Holland.

We have received from Geo. P. Rowell & Co., 10 Spruce street, New York, a "Book for Advertisers." The object of this book is to furnish for an advertiser and prepare his advertisement. For their services—designing his advertisement and preparing his estimate—they make a sufficient charge to pay for the required service of persons competent to do the work well. They tell the advertiser what papers he should use and what the price will be. If the advertiser wishes them to place the advertisement in the papers, they do as he directs, and for that service the newspapers pay them. If the advertiser wishes to place his advertising through some other advertising agency, or to contract with the publishers, he is at liberty to do so, and the estimate furnished by Messrs. Rowell & Co. serves as a guide. Every one who is in need of information on the subject of advertising will do well to obtain a copy of Geo. P. Rowell & Co's "Book for Advertisers," 368 pages, price one dollar. It is mailed, postage paid, on receipt of price, and contains a careful compilation from the American Newspaper Directory of all the best papers in the United States and Canada. It gives the circulation rating of every one and a good deal of information about rates and other matters pertaining to the business of advertising.

TRADE AND BUSINESS NOTES.

The A. A. Griffing Iron Company of Jersey City, N. J., have moved their Chicago office and store into much larger and more commodious quarters at 88 Lake street, where their general western agent, Mr. F. W. Somers, will be found with better facilities for catering to the large and increasing demand for the popular Bundy radiators. Mr. J. R. Bannon, Jr., having resigned his position as Philadelphia manager for this firm, Mr. Throop Mason will for the present represent them in the Quaker City.

The interest manifested in all our larger cities regarding the smoke nuisance makes any information on this subject of value Every device which is effective in reducing the volume of smoke is worthy of consideration. Among the furnaces invented for the better combustion of fuel and reduction of smoke is the Ritter Self-Feeding Smokeless Furnace. It is illustrated in our advertising pages, and has won hundreds of testimonials which commend it to public consideration. It has demonstrated by actual use that the claims made for it are not exaggerations, but that it has aided in lessening the smoke nuisance in this city. The chimney in the Home Insurance building gives evidence of the effectiveness of

this furnace. When the two stories were added to the building the chimney was built ten feet higher, and the workmen were not inconvenienced by smoke although the furnaces were in operation burning between six and seven tons of soft coal every twenty-four hours. The prevention of smoke is not the only claim made for the Ritter furnace. It saves fuel and adds to the life of boilers. which makes it valuable in an economic sense. Those wishing details regarding this furnace should address Ritter & Burke, 70, 90 La Salle street, Chicago, for particulars.

PLUMBING NOTES.

There is a strike on among the plumbers at Vicksburg, Miss. It is the result of the resistance to the ten-hour day by the general labor unions.

The master plumbers of Minneapolis have conceded the eight hour demand, with wages at $3.50 per day.

Brooklyn plumbers and gas fitters won eight hours. The union men must not work for masters who are not in the bosses' union, and vice versa.

As between plumbers' and doctors' bills the plumbers' are the cheaper.

With the supply of good plumbers we have there is no excuse whatever for bad plumbing.

It is perfectly right and just that a builder should be compelled to put good plumbing in his house whether he will or not. The evils of bad plumbing can be communicated from one house to another.

A man's ignorance can be no better displayed than by his procuring cheap and untrustworthy plumbing.

Whenever there is any reason to suspect the plumbing is out of order, a plumber should be called in to inspect it without delay. This is as important as calling in a physician when disease makes its appearance.

People can hire cheap shoemakers and tailors and get inferior work and material without any danger to health, but with plumbing it is altogether different. Inferior work and material are a continual menace to health.

The Association of the Master Steam and Hot Water Fitters of the United States held their third annual convention at the Continental Hotel, Philadelphia last week. The association was formed three years ago for the purpose of maintaining a uniform scale of prices and discounts throughout the entire country. In this endeavor it has been eminently successful, as 300 firms, doing seven-tenths of the steam and hot water fitting business of the United States, are now connected with this organization. Delegates were present from New England, all the Middle States and as far west as Denver.

The plumbing establishment of McMenamin & Norton at Lancaster avenue and Anderson street, Ardmore, Pa., was burned to the ground last week.

The plumber invests his capital, his skill and learning, accepts a great responsibility, does hard and difficult work, and should be paid well for it. Plumbers themselves should recognize this and make their charges accordingly. No one will value their services more highly because they set a low price on their work.

Up in the pipes where the microbes steal
Seeking victims night and day;
A plumber's trap had been skillfully set
Which caught the microbes on their way.

Every city in which plumbing work is done there should be plumbing ordinances strictly enforced. The people should demand this as a means of promoting health and for their own protection. The value of good plumbing has been fully demonstrated and there is now no theory or guess work about it.

The following delegates will represent the Portland, Ore., Association of Master Plumbers at the National convention: Fred Martin, August Donnerberg. Alternates, Robert Brady, Thomas Varwig.

Invitations have been extended to Health Commissioner Ware and Chief Inspector George to address the Chicago Master Plumbers' Association at their first meeting this month. An open meeting will be held on this occasion and all plumbers are invited to be present.

Following are the rules which have been adopted by the master and journeymen plumbers of St. Paul, Minn:

Rule 1. No plumber shall do gas fitting except to change a light, put on a fixture or such other work when it would not be practicable to get a gas fitter to do it.

Rule 2. No gas fitter, or other person shall run any pipe in connection with plumbing, except to make slight alterations when it would not be practicable to have it done by a plumber.

Rule 3. All plumbers shall cut their own vent pipes.

Rule 4. Union men will, under all circumstances, be given the preference of work on hand.

Rule 5. Each plumber and gas fitter shall do their own testing.

Rule 6. No gas fitter shall do steam fitting, and no steam fitter shall do gas fitting.

Rule 7. All overtime shall be paid for at the rate of time-and-a-half, except Sundays, which will be double time.

Rule 8. No person shall be allowed to do journeywork who has not worked at the trade continuously for three years.

Rule 9. Plumbers and gas fitters shall work the same number of hours in the winter as in the summer.

Rule 10. A violation of any of the above rules shall cause a suspension of work, after due notice has been given in the shop that it occurs in, pending arbitration.

When a plumber is appointed
The plumbing to inspect,
Then no cause will there be left us
Bad plumbing to suspect.

T. F. Clarke of the Kentucky Plumbing Company has withdrawn from the firm, which will in the future be composed of A. G. Putnam, president, and R. E. Putnam, manager. Business will be carried on at the same place, Pineville, Ky. Mr. Clarke has no financial connection with the above firm, which will assume all debts contracted while Mr. Clarke was a member of it.

Mr. T. F. Clarke, having severed his connection with the Kentucky Plumbing Company, will in the future work for the well-known plumber, P. J. Montague, Middlesborough, Ky., who has a number of large contracts at hand.

C. J. Prescott, of the plumbing firm of Prescott & Allen, 113 East Seventh street, Topeka, Kans., in sending his subscription for up into 1892, writes: "I consider THE SANITARY NEWS the best paper of its class published. I am with you and shall be glad at any time to be of use to either the cause or yourself in person." And we will be with you, Mr. Prescott, and the cause of good plumbing to the end, and whenever we can serve you or the cause, call on us, and you can't do it too often.

The Buffalo Master Plumbers' Association has admitted fifteen master plumbers to membership since February 1, and the association now numbers fifty-three members. The following are the delegates elected to represent the association at the National convention: Charles Geiger, J. L. Mensch, C. B. Huck, J. S. Stygall, Jr., L. P. Beyer. Alternates, Dean Wilson, F. C. Kamprath, John McGory, Thomas Kavany.

The plumber who cuts prices is doing himself, the trade and the public an injury.

Architecture and Building says that the Master Plumbers' Association of New York, in connection with the Journeymen's Association, have taken a similar step to that taken by the Brooklyn Association of Master and Journeymen Plumbers last year, that is, practically amalgamating through the medium of conference committees representing both associations. After October 1, 1891, all journeymen employed must be union men—by mutual consent of master and workmen—and it is understood that the workmen will not work for any other than master plumbers. All disputes and difficulties will be settled by the conference committee which is equally represented by both associations. By this action the master plumbers will undoubtedly secure greater trade protection at the hands of the dealers in plumbers' supplies, and avoid large losses by the foreclosure of mortgages, wherein, under the present regime they are wiped out and their claims confiscated to satisfy real estate sharks, while journeymen are hired direct to finish their work. This is a similar arrangement to the Brownstone

Cutters, and works admirably in their case as well as with the plumbers of Brooklyn, N. Y., where they avoid strikes and settle all difficulties amicably.

INFORMATION WANTED.

A reader of THE SANITARY NEWS in Albuquerque, N. M., wants all the information he can obtain on the treatment of sewage by the iron process, where he can get details, the salt of iron, etc., as he wishes to put the process in operation.

Another reader of Dubuque, Iowa, wants the address of a new manufacturer of enameled bath tubs located somewhere in Michigan.

A plumber in Louisville, Ky., wants information regarding the best "Plumbers' Discount Calculator."

Publication will be given any information furnished us regarding the above subjects.

When the plumbers all agree
About a system of good plumbing,
Why, you will find, twixt you and me,
To that same plan we'll all be coming.
For who should better know than they
How plumbing work can best be done?
For they have tried it many a day
And from experience knowledge won.

Public notice is hereby given that the co-partnership heretofore existing between Philip H. Gunderman and John C. Gunderman, under the firm name of Gunderman Bros., is this day dissolved by mutual consent, Philip H. Gunderman retiring from said firm. The plumbing, gas-fitting and sewering business heretofore carried on by said firm will be continued at 182 North ave., Chicago, Ill., by John C. Gunderman, who will collect all outstanding accounts and close up all other business affairs of said firm.

PHILIP H. GUNDERMAN,
JUNE 1, 1891. JOHN C. GUNDERMAN.

Our Mr. Young made a pleasant call this week at the offices and show rooms of the Stewart Ceramic Company, 323-5 Dearborn street, this city, and had a very pleasant chat with Mr. Wm. H. Griffin, who has charge of the Chicago house. He has on exhibition a complete line of fine goods, and his display of laundry tubs and sinks is unsurpassed, and well deserve the reputation they enjoy. We bespeak for Mr. Griffin and the company he represents the success which the quality of their goods richly deserves.

WHERE PLUMBING WORK IS BEING DONE.

Ashland ave. and Polk, Mandable & DeViney; 329 Armitage, W. J. Hogan; 70 Brigham, Chas. Breyer; 406 Berlin, P. Gow; 5118 Carpenter, C. J. Boyd; Center and Selwyn, S. Dutcher; 139 Cornell, W. J. Muller; Cortland and Oglesby, C. Kostlevy; 4045 Carroll ave., T. Low; 528 Chestnut, D. T. Dewar; 252 Chicago ave., Chas. Breyer; Cleaver and Blackhawk, Chas. Breyer; Champlain ave., J. H. Kilian; 31 Cornelia, Garner & Bahn; 39 Churchill, P. Gow; 406 Duncan Park, A. Miller; 653 Davis, P. Gow; Drexel ave. and Sixty-third street, D. Walsh; 852 W. Eighteenth, C. Kostlevy; 958 Elkgrove ave., P. Gow; 150 Fowler, P. Gow; 41 Fortieth place, J. Connelly; 825 Forty-seventh, O. J. Boyd; Hermitage and Jackson, Geary; Huron near Forty-ninth, T. Low; Honore and Sixty-sixth, D. F. Dewar; Honore and Sixty-sixth Court, D. F. Dewar; Hoyne and Potomac, Chas. Breyer; 76 Humboldt, P. Gow; 786 Humboldt, P. Gow; Indiana near Forty-seventh, T. Low; Indiana near Forty-ninth, T. Low; Indiana near Fiftieth, T. Low; Kinzie near Forty-eighth, T. Low; 927 N. Kedzie ave., G. B. Kemp; 834 Logan, C. J. Boyd; 897 Leavitt, M. Weber; 174 Linden ave., Garner & Bahn; 1539 Lexington, R. Robertson; Langley and Sixty-sixth, D. Walsh; 235 Maxwell, C. Kostlevy; 163 Mozart, P. Gow; North ave. and Wood, Chas. Breyer; 94 Newton, Chas. Breyer; 67 W. Nineteenth Chas. Walter; 813 W. North ave., P. Gow; 4310 Oakenwald, Edward Goehst; Ohio near Forty-seventh, T. Low; Ontario bet. Forty-eighth and Forty-ninth, T. Low; Oakley and Frankfort, Chas. Breyer; 518 Paulina, W. J. Muller; 4231 Park ave., T. Low; 513 W. Polk, J. P. Shannon; 71 Perry ave., Garner & Bahn; 612 Rosenmerkel, D. T. Dewar; 411 Robey, McDonald; 278 Rumsey, Chas. Breyer; 1073 Robey, P. Gow; 882 Shober, P. Gow; Thirty-first and Wallace, P. Schmid; Taylor and Desplaines, A. M. Cameron; 577 Thomas, P. Gow; Wood and Fiftieth, C. Kostlevy; 4328 Wabash ave., E. Hennessey; Winter and Seventy-first, D. T. Dewar; 1050 N. Wood, Chas. Breyer; Wood south of Jane, M. J. Hogan; Woodlawn and Sixty-first, Sims & Son; Warton and Sixty-seventh, D. Walsh.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: D. H. Burnham has completed the plans for the new 16-story Ashland office building to be built at the northeast corner of Randolph and Clark streets, by R. A. Waller and L. Broadhead. It will be 140x80, and will be fireproof, with gray colored pressed brick walls and terra cotta ornamentation. It will be thoroughly modern and will cost $750,000. S. S. Beman has prepared plans for 6-story apartment house, 120x100, to be built on Michigan avenue, near Fourteenth street, by the trustees of St. Luke's Hospital. There will be twenty apartments of eight rooms each and four stores; cost, $125,000. He has also prepared plans for the rebuilding of the shops of the Pullman Palace Car Company at St. Louis, which were detroyed by fire recently. There will be seven buildings and all will be constructed of stone and brick. The same architect is engaged on plans for a beautiful residence to be built on Michigan avenue, near Eighteenth street; cost, $35,000. Thomas & Rapp have planned a 4-story apartment house, 51x116, to be built at the southeast corner of Vincennes avenue and Fortieth street, by H. B. Smith; cost, $45,000. They are also planning three 3-story houses, 57x71, for Mrs. Cook, to be built on Ellis avenue, near Thirty-eighth street. For G. D. Holton they have planned a 3-story residence, to be erected on Drexel boulevard, just north of Forty-third street; cost, $35,000. H. S. Jaffray and E. J. Ohrenstein have planned a 5-story apartment house, 175x84, to be built on Cottage Grove avenue, north of Thirty-ninth street; cost, $80,000. They have also planned a 3-story flat building, 76x60, to be built on Congress street, near Fancisco; cost, $23,000. They have also designed a $6,000 dwelling to be built at Oak Park, Ill. Flanders & Zimmerman have completed plans for the Sherwood, a 3-story school building, 75x150 to be erected at Fifty-seventh and School streets, by the Board of Education; cost, $40,000, They have also prepared plans for the Forestville school, to be built on St. Lawrence avenue, near Forty-fifth street. J. A. Thain has planned a 3-story and basement residence for Adolph Loeb, to be built at 3622 Grand boulevard; cost, $25,000. W. J. Taylor of 612 First National bank building, has had plans proposed for seven 3-story dwellings, 150x72, to be built on Washington avenue, near Fifty-first street; cost, $70,000. Perley Hale has let contracts for the erection of a 5-story store and flat building on State, near Eighteenth street, by Allen McCullough. The front will be of red sandstone, with metal bays; cost, $50,000. He is also preparing plans for five 3-story dwellings, 103x65; to be built on Calumet avenue, south of Fortieth street, by J. & J. C. Beifield. They will be constructed of sandstone, with hardwood interiors; cost, $40,000. W. A. Arnold has planned a church for the Methodist Episcopal congregation at Lawndale. It will be 50x70, of pressed brick and stone, with slate roof; cost, $10,000. He has also planned a $3,000 dwelling for Mrs. Hulda Clement at Evergreen Park. S. Linderoth & Co. are preparing plans for five 2-story dwellings for B. F. Cronkrite & Co., to be built at Forest Ridge. They will be constructed of frame with stone basements; cost, $30,000. He is also planning a Swedish Baptist church to be built at Muskegon, Michigan; cost, $10,000. Alfred Smilh has planned a 3-story and basement residence, 25x65, to be built at 389 Ashland avenue by J. L. Haverkamp. It will be constructed of St. Lawrence marble, with hardwood interior, heated by hot water; cost, $13,000. Fred. Alschlager has planned a 5-story and basement store and flat building, 25x96, to be built at 1814 State street by John Drier; cost, $20,000; also a 3-story store, flat and hall building for W. E. Shaunnessey, to be built at Fifty-ninth and Halsted streets. Charles S. Frost has planned a 3-story residence for William G. Hibbard, to be erected on Calumet avenue; cost, $18,000; also a railway station for the Chicago & Northwestern Railroad Co., to be built at Glencoe. It will be

constructed of stone; cost, $10,000. I. K. & A. B. Pond have planned a 2-story basement and attic residence for H. E. C. Daniels, to be built at Evanston; cost, $8,000; also for A. C. Porter, at Rockford, Ill., a $7,000 residence. H. B. Wheelock has planned a 2-story factory for the Western Coated Paper and Cord Co., to be erected at Riverview; cost, $25,000. J. E. O. Pridmore has planned a 4-story and basement store and flat building for H. D. Hollister, to be built at 4313 Cottage Grove avenue; cost, $12,000. Julius Wegman has planned a new 2-story detention hospital, 100x80, to be built at Wood and Polk streets by the Board of County Commissioners; cost, $35,000. W. R. Gibb has planned a 2-story and basement residence, 24x55, for Mrs. Florence E. Hoffman, to be built at 1067 Warren avenue; cost, $10,000. J. N. Tilton has planned a 3-story residence, 22x72, for W. D. C. Street, to be built on Schiller, near Astor street; cost, $8,000; also two houses for R. A. Waller, to be built at Buena Park; cost, $8,500. ——New York City, N. Y.: Jordan & Giller have designed a 6-story and basement, with sub-cellar, building, 50x90; brick, iron and stone front, to be built at 33 and 35 South Fifth avenue at a cost of $50,000. Hubert, Pirrson & Hoddick have drawn plans for the 12-story fireproof apartment hotel which the Marquis de Crosic proposes to build on the southwest corner of Fifth avenue and Eighteenth street. It will be 75x98.9, and later will be increased to 175x89.9. Richard Berger has designed for I. Lewkowitz a 3-story and basement brick, iron, stone and terra cotta building, 37.6x95.11; to be built at 26 east One-hundred and Twenty-fifth street, at a cost of $30,000.——Philadelphia, Pa.: Contractors have been invited to submit estimates upon plans prepared by Architect T. Roney Williamson for a school-house and an addition to the Court House at West Chester. Architect Addison Hutton has prepared the plans for extensive alterations to be made to the hotel at Beach Haven owned by Robert Engle. The work upon the 7-story building for Dunlap & Clark, to be erected on the south side of Filbert street, west of Thirteenth, will be started within a few days. The plans for the handsome 7-story office building to be erected on the south side of Filbert street, west of Thirteenth, for Dunlap & Clark, the printers, were submitted to the Board of Building Inspectors last week. John Laughlin will build immediately thirty-four 3-story houses on the west side of Colorado street, north of York, and later in the season he will build another row in the same block. The Belmont Oil Works will be rebuilt at once. Two immense mills will be erected at Ninth street and Susquehanna avenue, by John W. Sullivan & Sons, who now operate a large plant at Ninth street and Montgomery avenue. The two new factories will be of plain brick. Architect Thomas Lonsdale will soon invite estimates for the new edifice to be erected by the congregation of the Western Methodist Church. ——Brooklyn, N. Y.: It is stated that all the preliminaries in the way of estimates, etc., for the new armory to be built for the 14th Regiment of the N. G. S. N. Y., are completed, and that work on the building will begin at once. W. A. Mundell is the architect, and the plot chosen is between Fourteenth and Fifteenth streets, on the east side of Eighth avenue. Mercein Thomas has completed plans for five 3-story and three 2-story brick dwellings, to be built on the east side of Greene avenue, near Throop. They will be 20x45. He has also plans for six 3½-story brick, stone and terra cotta houses, 20 and 22x55, to be built for W. C. Bush on the north side of Garfield place, near Ninth avenue. R. B. Eastman has completed plans for changes and improvements to be made by Dr. J. V. Mattison, on the east side of Brooklyn avenue, between Prospect and Park places. The house will be extended at both ends and the rear, and raised to a 3-story building with tile roof. It will have a frontage of 125 feet, a depth of 50 feet, and is to be built of stone. The cost is estimated at $100,000.——Boston, Mass.: The Massachusetts Rifle Association is about to erect a new 2-story club-house at Walnut Hill. The plans have been supplied gratuitously by Mr. Charles H. Eastman, a member of the association, and in short time the building of the club-house will commence. Coon & Hall have commenced to put in foundations for the Boylston street extension of Hotel Reynolds for the Rupp estate. Fred. Pope, architect. The building will be eight stories, and 100 feet high.——Cincinnati, Ohio: Architect J. W. McLaughlin has plans for an office building which is to be remodeled and two stories added. To be 63x65, two stories, built of brick and stone; cost, $25,000; owners, T. & A. Pickering. Architect H. E. Siter has plans for a residence to be erected at Avondale, O., for Chas. G. Merrill; cost, $5,000. Architects Pfeffer & Dietz have plans for a store and flats for Henry Fohrman; cost, $5,000. Architect A. O. Elzner has plans for an opera house, to be erected in Winchester, Ky.; cost, $30,000. Architects Crapsey & Brown have designed alterations and additions to brick dwelling for A. R. Burnham, Richmond, Ky.; cost, $8,000; school-house, 68x68, two stories high, to be erected at Waynesville, O.; cost, $20,000. Architect Gustave W. Drach has designed a 3-story flat for Dwight Huntington, to be erected on Mt. Auburn; cost, $15,000. Two dwellings for Mrs. Duhme, to be erected in Clifton, to cost about $12,000.——Washington, D. C.: Architect Fred. G. Atkinson has plans for a dwelling for Mr. M. I. Weller. It will be on C street, between Fourth and Fifth streets, southeast, and will be a double house, 36x62, three stories and cellar; cost, $13,000. Mr. J. R. Littell has commenced the erection of a handsome dwelling on S street, between Sixteenth and Seventeenth streets, northwest, from plans by Architect W. J. Marsh.

HEATING AND LIGHTING.

New electric light plants or additions to existing plants are reported as probable at the following places: Atlanta, Ga., address R. R. Lockett, mayor; Anniston, Ala., address the Anniston Gas & Light Co.; Paris, Tex., address the Mayor; Merlin, Tex., address the Mayor; Lake Charles, La., address the Mayo Poe Shingle Co.; Convers, Ga., address J. R. Maddox, mayor; Cedartown, Ga., address the Mayor; Greenville, S. C., address the Greenville Gas, Electric Light & Power Co.; Petersburg, Va., address the City Point Land & Improvement Co.; Greensboro, N. C., address J. A. Odell; Athens, Tenn., address M. M. Henderson, Chattanooga, Tenn.; Elizabeth City, N. C., address the Elizabeth City Electric Light Co.; Wheeling, W. Va., address the Mayor; Cincinnati, O., address the Corporation Counsel; Hamilton, Wash., address J. L. Warner; Lafayette, La.; Redlands, Cal.; Santa Fe, N. Mex., address F. T. Webber. The following new electric light companies have been formed: Princeton Electric Light & Power Co., Princeton, Ill., capital stock $50,000; Noblesville Water & Light Co., Noblesville, Ind., capital stock $50,000; Clinton Electric Light & Power Co., Clinton, Ind., capital stock $10,000; Dunellen Electric Light Co., Dunellen, N. J., capital stock $5,000, incorporators, H. N. Spencer and W. R. Codington, of Plainfield, N. J., and others; the Wilmington (Del.) Light, Heat & Power Co., with a capital of $50,000; the Waterford (N. Y.) Electric Light & Power Co., with a capital of $30,000; the Eureka Springs (Ark.) Electric Light and Street Railway Co., capital $50,000; the Watseka (Ill.) Electric Light Co., capital $8,000; the Texarkana (Ark.) Light & Power Co., capital $125,000; the Iron Mountain (Mich.) Electric Light & Power Co., capital $50,000.——Oyster Bay, N. Y.: An electric light plant is to be established at this place at an estimated cost of $10,000.——Sayre, Pa.: Efforts toward establishing an electric lighting plant are being made.——Wheeling, W. Va.: The city will vote on the issuance of $80,000 of electric light bonds.——Grand Rapids, Mich.: The town council department will advertise for bids for municipal electric lighting at an early day.

SEWERAGE NOTES.

Lebanon, N. H.: A sewerage system is being discussed.——Brockton, Mass.: The aldermen have authorized a $10,000 loan for sewers.——Palmer, Mass.: Preliminary surveys have been made for sewers.——Pittsfield, Mass.: Sewer bonds to the amount of $100,000 have been issued.——Waltham, Mass.: The issuance of $150,000 of sewer construction bonds has been authorized.——Westboro, Mass.: Surveys have been made and the people will vote on the question of a system of sewers.——South Orange, N. J.: The question of a system of sewage disposal is being agitated. A sewage farm is proposed.——Baltimore, Md.: An additional $48,500 has been appropriated for sewers.——Greenville, S. C.: It is proposed to put in a system at a cost of from $15,000 to $20,000.——Nashville, Tenn.: The city council has appropriated $60,000 for sewers in three streets.——Anderson, Ind.: A sewerage system will be built at a cost of $75,000.——Ottawa, Ill.: A sewerage system is proposed, and Andrew Rosewater, of Omaha, is making examinations.——Streator, Ill.: The council has ordered preliminary surveys and plans.——Highlands,

Colo.: Sewer bonds to the amount of $40,000 have been voted. ——Hancock, Mich.: C. L. Loweth, C. E. of St. Paul, Minn., is making plans for a sewerage system.——Grand Forks, N. Dak.: Address Mayor Richardson in regard to a proposed sewerage system.——Pueblo, Colo.: Extensive sewer improvements have been authorized. Address Alderman Lloyd.——Elgin, Ill.: Important sewer extensions have been authorized. Address Mayor Grote.——Erie, Pa.: Additionals ewers will be built. The city engineer can furnish particulars.——Laramie, Wyo.: The city council has been petitioned to extend the sewerage system at an estimated cost of $10,000. Chattanooga, Tenn.: $75,000 of sewer bonds have been sold and a large amount of sewer construction will soon be in progress.——Glens Falls, N. Y.: The city is being surveyed for sewers.——Shelbyville, Ind.: The residents of the First ward are now agitating sewerage.——Paducah, Ill.: A system of sewers is proposed.——Florence, Ala.: The council has authorized the issuance of $35,000 of sewer bonds.

WATER WORKS NOTES.

Gorham, Me.: A company has been chartered.——Lominster, Mass.: Old mains will soon be replaced with new iron pipe.——Orange, Mass.: A new water supply to cost $110,000 is proposed, ——Rochester, N. Y.: Additional mains will be laid.——Altoona, Pa.: The people have voted $220,000 for a new water supply.——Radford, Va.: W. P. Gunn is secretary of a company organized to supply the eastern part of the town.——Macon, Ga.: Address H. R. Dill for particulars concerning proposed water works.——West End, Ga.: J. A. Caldwell, city clerk, wishes prices on a 100-foot water tower, 10,000 feet of 8-inch and 10,000 feet of 6 and 4-inch pipe, also on hydrants.——Luverne, Ala.: Works are projected.——Troy, Ala.: The city will build works; cost, $35,000.——Uniontown, Ala.: Plans and specifications for a complete system are being prepared.——Bridgeport, Ohio: Works are being designed by Dunham & Paine.——Niles, Ohio: A system will be built at once.——Indianapolis, Ind.: The mains will be extended. Irvington, a suburb, is agitating the question of putting in a complete system.——Litchfield, Ill.: The Litchfield Water Supply Co. has been incorporated by F. B. Milner and others.——Morton Park, Ill.: A supply from wells is projected.——Friend, Neb.: Works to cost $20,000 will be built.——Great Falls, Mont.: The council has ordered two miles of new mains.——Prescott, Ark.: The town wishes to let a contract or grant a franchise to build works.——Seattle, Wash.: The purchase of two 6,000,000-gallon pumps has been recommended.——Danville, Ill.: The Story Creek Water Co. has been incorporated with a capital of $200,000. Louis Platt can furnish particulars.——Vineville, Ga.: Reports say that water-works will be established.——Luverne, Minn.: Plans and specifications for a new system have been completed. ——Findlay, Ohio: The water-works plant will be extended at a cost of $20,000.——Riverside, Ala.: A system of water-works is proposed.——Pueblo, Colo.: Numerous important water-main extensions are to be made. Alderman O'Brien can furnish particulars.——Ionia, Mich.: Additional pipes will be laid.——Livingston, Mont.: The Mayor can furnish information in regard to proposed improvements in the present system.——Louisville, Ky.: The system will be extended.

BIDS AND CONTRACTS.

Cincinnati, Ohio: Proposals are wanted until June 13 for four steel boilers, 5x24 feet, with four 11 and two 16 inch flues, also for five steel boilers, 4¾x24 ft., with four 9 and two 13 in. flues, also for two steel boilers, 5 ft. 2 ins.x28 ft., with one 18 and four 14 in. flues. For information, address W. P. Sharp, supt. water works.——Niles, Ohio: Bids are wanted until June 30 for water works.——Perry, Iowa: New bids are wanted for water works, all former bids having been rejected. The amount involved is $15,000 and the town clerk can furnish particulars.——Denver, Colo.: Bids are open until June 9 for the erection of the government building at Denver, Colo.——McPherson, Ga.: Bids for erecting officers quarters are open until June 13. Address Capt. J. W. Jacobs, U. S. A., Atlanta, Ga.——Norfolk, Va.: Until July 27, bids will be received for the erection of a court house and jail. ——Harrodsburg, Ky.: Sealed proposals are invited until June 15 for a system of water works.——Maywood, Ill.: Sealed proposals are invited until June 24, for an outfall sewer on South Third street from the Desplaines river to Ninth avenue, and for lateral sewers on South First, Second, Third, Fourth, Fifth Sixth, Seventh, Eighth and Ninth avenues, in accordance with the ordinance. The work comprises about 1823 feet of 25-inch brick sewer, 332 feet 18-inch pipe, 332 feet 15-inch, 1687 12-inch, 6234 feet 9-inch, 4141 feet 8-inch, 3267 feet 6-inch pipe, 150 catch basins, etc. Profiles and specifications and blank forms for bids can be seen at the office of C. W. Maynard, 84 and 86 La Salle, room 520, Chicago.——Boston, Mass.: Bids are wanted until June 13 for the construction of certain sewers.——Savannah, Ga.: Sealed proposals will be received until July 15 for furnishing and constructing two high duty pumping engines, each of 10,000,000 gallons capacity per day. For particulars address, Thomas T. Johnston, consulting engineer, at 171 LaSalle street, Chicago.——Sault Ste. Marie, Mich.: Proposals for constructing sewer and water systems at the new Post of Fort Brady, Mich., will be received until June 23. Address Geo. S. Hoyt, Capt. and A. Q. U. S. A.——Dayton, Ohio: Sealed proposals will be received until June 17, for the steam heating apparatus for the new government building at Dayton, Ohio. Address the Supervising Architect at Washington.——Brooklyn, N. Y.: Proposals are wanted until June 23, for the steam-heating, plumbing and gas-fitting in the Twenty-third Reg. Armory. Address Hon. I. C. Perry, architect, Capitol, Albany, N. Y.——Wayne, Neb.: Proposals are wanted until June 24 for the construction of a system of water works at an estimated cost of $18,000.——Hallettsville, Tex.: M. S. Townsend, Mayor of this place, wants bids for a system of electric lights—engine and dynamo, with capacity of 300 incandescent lights, to be distributed over four miles of circuit. Bids will also be received for a combination system of 10 arc and 200 incandescent lights over a circuit of two miles.

SUNDAY IN THE COUNTRY.

Commencing Sunday May 24th, and regularly each Sunday thereafter during the summer season, the Wisconsin Central will run a Sunday Excursion train between Chicago and Waukesha, making stops at all intermediate stations, leaving Chicago at 8:30 A. M., and returning, arriving in Chicago at 8:30 P. M. Commencing Monday the 25th, and regularly each Monday thereafter during the summer season, a train to be known as the "Business Man's Special" will be placed in service from Waukesha to Chicago, leaving Waukesha at 5:30 A. M., and arriving in Chicago at 9:00 A. M. These trains, with the regular service on Saturdays leaving at 3:00 P. M., 4:25 P. M., and 5:00 P. M., make it possible to spend the day in the charming lake region in Northern Illinois, reached by the Wisconsin Central, and return in time for business Monday morning.

For detailed information as to intermediate time, excursion rates, etc., apply to Geo. K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or F. J. Eddy, Depot Ticket Agent, Harrison street and Fifth avenue, Chicago, Ill.

THE MASTER PLUMBERS.

If you are going to attend the meeting of the Master Plumbers in Cincinnati in June don't forget the Old Reliable and justly popular Big Four Route, running the finest trains and being the only line from Chicago that lands passengers in the Grand Central Station, Cincinnati. Reduced rates will be made for the meeting. Address for rates, etc., J. C. Tucker, General Northern Agent, 234 Clark street, Chicago.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.
* * * *
But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

THE SANITARY NEWS

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SUBSCRIPTION RATES.

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ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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BUILDERS should remember that the plumber is the man who knows more about plumbing than any one else, and when they want plumbing done he is the man to go straight to.

WE would like to have practical plumbers inform us what their experience is with vent pipes; if ever in their practice they find these vents impracticable, and under what conditions.

A BUILDING at the World's Fair in which the plumbing and drainage were made perfect would give a lesson in house sanitation which would prove of value to all interested in building construction, and to every man, woman, and child who desire healthful homes.

THE closest of plumbing inspection is needed not only to prevent the plumber from violating the plumbing regulations, but to compel the public to provide plumbing in accordance with the ordinances. In general the plumber would supply the work required if the owner of the building would allow him to do so.

WE do not think it is profitable for the journeymen plumbers at any place or under any conditions to enter into a federation with other trades. There may be a certain sympathy among all trades and a brotherly good will prevail, but the spirit pervading the trades is dissimilar, and has nothing in common when the actual interests of the trades are considered. The journeymen will have enough to do when they lookout well for themselves—their interests and the interests of the employers. When a federation of dissimilar trades aim to regulate all trades in common it will fail for there can be no common interest. When a journeyman plumber, for instance, as at Indianapolis or Milwaukee, refuses to work on a building where a hod-carrier, carpenter, or mason is employed who is not a member of a union or the federation, he is intervening the purposes of his employer in a matter over which the employer can have no possible control. The master plumbers cannot say whom a contractor for other work may employ. They can have no control of any of these matters. They have to do with their own business only and cannot say what class of workmen shall be employed by other employers. Federation is impracticable when carried to this extent and wholly unjustifiable and wrong. Journeymen in such a federation cannot expect to retain the sympathy and aid of the masters, for their interest is linked with that of other employers as much as with the master plumbers.

THE master plumbers of this country have done much to improve the quality of plumbing work and material. Their record in this stands face to face with every man who is acquainted with their work. Side by side with their progress in this important work—important to the public—is it out of place for them to do something for the improvement of their own condition? Everything being equal they will serve the public better when they serve themselves best. The plumbers have served the public well in making it possible for everyone to have a habitation in which the plumbing and drainage are perfectly sanitary. Could not the public now serve the plumbers in turn by making it possible for them to do good work and use good material at fair prices?

SPEAKING in regard to the World's Fair, the Philadelphia *Record* says editorially: "One thought, however, which should command the timely attention of the managers is that of sanitation. The herding of humanity in such vast aggregations involves the highest considerations of public health; and these, it is almost superfluous to say, cannot be safely ignored nor disregarded by the management." The management of this mammoth exhibition cannot be too often or impressively warned regarding this subject. The city officials cannot ignore the sanitary needs of Chicago and escape censure. The city at all times requires constant and intelligent care, but during the exposition diligence will have to be redoubled. The work should be commenced now, as its magnitude requires time and a great amount of thought and labor.

HEALTH COMMISSIONER WINGATE, of Milwaukee, has devised a plan for the disposal of garbage of that city. The contract with the garbage crematory expired the first of this month and no

means were provided for the disposal of refuse. It will be some time before another contract can be made, and in the meantime Dr. Wingate proposes to supply the garbage to farmers who will plow it under. The farmers have agreed to plow the refuse under the ground each day for a small consideration. As the refuse will have to be delivered at the farms, more garbage wagons will have to be put on, thus increasing the cost of collection. This increase will be off-set, however, by there being no expense for cremation. The amount paid to the farmers will be very small, and on the whole the expense of disposing of the garbage will be about the same as before. The collections will be made at night, the wagons beginning their rounds at 10 P. M. The garbage will thus be delivered at the farms before morning. It will take several weeks to let the contract for the permanent disposition of the garbage. Dr. Wingate has demonstrated his ability to take care of the sanitary needs of Milwaukee, and should receive the support of every citizen of the place. The members of the council who oppose him have simply adopted this means of displaying their ignorance of matters so important that they are beyond their comprehension. We find such in all places, and the sooner they are relegated to obscurity and silence the better for all concerned.

COMPULSORY SANITARY REGISTRATION OF BUILDINGS.

We find in *The Sanitarian* an abstract of a paper read by W. Lee Beardmore, A. M. I. C. E., before a meeting of the Civil and Mechanical Engineers' Society, London, which contains some good suggestions to adopt in this country. The lecturer referred a bill which had been drafted by a committee of which he was a member, appointed by the council of the society to consider the Sanitary Registration of Buildings Bill, 1887. He pointed out that the intention of the suggested bill is to put all places where food is supplied or whence it is distributed, or such institutions as schools, colleges, hospitals, and asylums, and hotels, boarding and lodging houses, into such a sanitary condition that no disease could be disseminated through the medium of their drainage arrangements, which he avers are now only too frequently defective. He further stated the importance of such buildings as hair-dressers' saloons, police stations, law courts, railway stations, public conveniences, and public places of amusement being brought under the application of such a bill as the one suggested.

He considered that the advances of sanitary engineering are becoming more felt every day, and builders now construct houses with far more satisfactory drainage arrangements, partly, no doubt, because it is an advertisement for such houses, and partly because the public are now more alive to the importance of good sanitation, and insist on houses being healthy residences certified to by their own professional advisers. But, he argued, if this be the case, how much more necessary it is that some such measure as the bill drafted by this society in 1887 should be brought into force, for if one lives in a sanitary residence how great must become the risk and danger, if one, for purposes of change of air or otherwise, removes to a residence with primitive and insanitary drainage arrangements.

He pointed out how children from healthy homes are sent to insanitary schools, and people with shattered health or seeking change of air, leave perfectly-drained residences for ill-drained lodgings, boarding-houses, hotels, &c., and called attention to the great necessity for such buildings as are above referred to, being made compulsorily sanitary, and registered as such in accordance with an Act of Parliament, and a certificate having to be exhibited to that effect in a conspicuous place in such buildings. He maintained that were it possible to ascertain the sanitary condition, as regards the drainage arrangements, of such buildings, it would be astounding how few, if any, accord with the standard of sanitary efficiency required by the minimum sanitary arrangements to be certified as suggested in the bill drafted by this society. Numerous diagrams were hung in the room illustrating different kinds of insanitary appliances, etc., which are likely to be met with in such buildings as have been mentioned above, and also showing sanitary apparatus that should be employed in healthy residences.

In concluding, the author pointed out how insanitary stable drainage arrangements are a grave source of danger when situated in close proximity to dwellings, and referred to large public institutions, with regard to which he has been consulted, and has reported upon as anything but sanitary, such as colleges, hospitals, etc.

We step in an elevator in this country and see hanging in plain view a certificate of inspection; our hotels and theatres delight in advertising that they are "absolutely fireproof," and all the advantages of site and scenery are graphically given in descriptions of health resorts; yet we never see the least evidence given that any building is in a thorough sanitary condition or that the drainage has been made meet the demands of approved sanitation. We take too many matters of this kind on faith and the result is about as disastrous as that of the "faith healer's" art. That portion of the public which necessarily enter public buildings, have no assurance of the healthfulness of such places and are entirely at the mercy of conditions over which they have no control. All such places as have been above mentioned should be required to have a certificate from the proper officers that they were in a satisfactory sanitary condition, and they should not be allowed to open until such certificate was granted. This should be done after thorough, intelligent inspection, and with the full assurance that the buildings are in a perfect state of healthfulness.

NOTES AND NEWS.

Old bagging is being worked up into bricks for artistic decorations.

Frozen game partakes and absorbs whatever impurities the ice may contain, and everybody knows that the best quality of ice is never used for packing.

All incandescent electric lights should be shaded for desk workers. Since they have been generally introduced, it has been found that where the rays fall direct upon the eyes of newspaper writers and desk workers, there has been a great increase of complaints of dimness of sight and imflammatory affections of the eyes.

In Toronto the newly appointed medical officer is stirring up the dry bones of the authorities and inaugurating some useful reforms. He has been investigating the milk supply of the city, and has found a much worse state of affairs than has been suspected. It is stated that there are cases where milk is sent to the city from cows in the last stage of tuberculosis.

Were one to take the patents which have been proved commercially unpractical, and trace them to the source from which they originate, it would be found—almost without exception—that the inventer was a man who had stepped out of his own business and had invented some wonderful thing in a line with which he was unfamiliar.—*Journal of Useful Inventions.*

Each one of us is bound to make the little circle in which we live better and happier; each of us is bound to see that out of that small circle the widest good may flow; each of us may have fixed in his mind the thought that out of a single household may flow influences that shall stimulate the whole commonwealth and the whole civilized world.—*Dean Stanley.*

In science a writer says, that while as yet we have discovered no way of avoiding contagion which comes to us in the air, we are beginning to find out the important fact that the air does not become contaminated with bacteria unless they are allowed to dry. Recent investigations, he adds, have shown a smaller number of bacteria in the air of a well-kept sewer than in that of a poorly-ventilated school room.

Among the subjects proposed for discussion at the seventeenth meeting of the German Public Health Society, which will take place at Leipzig, on September 17th and 20th, are the following: Report of the Committee on Systematic Researches as to the Self-Purification of Rivers; Sanitary Administration in relation to Dwellings; Sanatoria for Sufferers from Pulmonary Complaints (to be introduced by Professor von Ziemssen, of Munich); Milk in its Hygienic Relations (to be introduced by Professor Soxhlet, of Munich); Cool Chambers for Meat and other Articles of Food (to be introduced by Professor Franz Hofmann, of Leipzig). "Gymnastic Inspector" Hermann, of Brunswick, will deliver an address on the School Games of German Youth.

It is a mistake to throw the kitchen refuse fresh upon the fire, for then the combustion is imperfect, and very offensive odors are

given off. It should always be placed in a receptacle specially arranged for the purpose at the stove. The ordinary heat of the stove will dry out all moisture and leave charcoal, which may be burned like other fuel. There are several patented devices already in the market for this purpose. One of them is obtained only in the construction of the stove, and consists of a receptacle in the side of the stove in which the garbage is put, completely desiccated, and then dumped into the fire. Another consists of a small pail arranged for the purpose, it can be applied to any stove, and is said to answer the needs well.

Lately published experiences of the Pennsylvania Hospital illustrates an important point for medical officers and others to remember. It is clearly shown that typhoid patients brought to hospital before the end of the first week, unless suffering from a very virulent type, are likely to recover. Parallel cases brought in during the second week show three times the mortality. A simple climax is completed by the following clear and concise statement:—"When brought in the third week the mortality is terrific; it is a miracle if the patient does not die." These striking facts are borne out by the experiences of fever hospitals in Great Britain. To move such patients then after the first week is very dangerous.

Dust is the great conveyor of micro-organisms. At 2 A. M., when a city is most quiet, the fewest germs are to be found in the air; at 8 A. M., the industry of domestic servants and dustmen has already made the air teem with germs. At 2 P. M., the proportion has again greatly fallen; at 7 P. M., it is once more high, for many houses are being "tidied up;" besides sundry kitchen operations are unhygienic. Thus the "small hours," unfavorable in many respects to patients hovering between life and death, are the least septic of the twenty four. The day proportions indicate that household duties cause more septic diffusion than is excited by traffic and industry.

The great demand to-day is for practical men—men who know the in and outs of the various departments of business in which they may be engaged. The Atlanta *Constitution* puts it thus pointedly: The day has gone by when gentlemen of shattered fortunes are selected for positions of lucrativeness and influence when by education and experience they are not fitted for the duties of their positions. The time has come when the young man of the workshop and the young man of the college stand the same show—all other things being equal. Each may rise to prominence and attain prosperity as his talents warrant or suggest such promotion. "Sobriety, honesty, energy and a conscientious idea of duty and its execution are the pillars that support the mansion of success."

NOTES ON THE CARE OF SEWERS.*

Assuming first that the sewer or system of sewers has been well designed for the work it is to do, and properly located, the care given to the sewer or system should begin when the first brick or pipe is laid, and should continue so long as the sewer is in use. The average "city father" of the average city is not educated up to the point of believing that anything more is necessary to the procuring of a sewer than the employment of some one to build it. He thinks, in brief, that a sewer is an elongated hole in the ground, surrounded by brick or pipe, laid in some shape by somebody, and that any special oversight of skilled labor used in behalf of the city during construction is an unnecessary refinement of engineering, and any money spent afterwards for supervision or care of the work is so much additional and useless tax upon the citizens. Such is about the belief of the average father, but I am happy to say that my lot has been usually cast among those of a better belief. We, as engineers, know that almost any man can lay pipes in the ground or pile up bricks and mortar; that it takes a skillful man and a mechanic to make a good sewer of the same materials.

The first great care of the engineer in building a sewer is to see that his alignment and grade are true, and the second is to see that the materials are of the best description and properly placed. In the matter of alignment and grade, it seems almost imperative that each pipe should be laid to a line in order to get the best results. It is the practice in some places to give a stake on the side of the proposed trench, from which to measure for both line and grade, and in other places the line is marked out in advance by stakes, and the grade afterwards given in the bottom of the trench. In still other places the approximate line is worked on the ground in advance, and the grade is given as about so much below the surface here, and about so much there, leaving the sewer builder to regulate affairs in between points as suits him best, regardless of results. Any method which will secure a straight and true line of sewer is a good one; the one of placing grade points on line and at an even number of feet above and parallel to the water line seems to be the best. From these points a line can be stretched, and from this line each length of pipe should be set by a plumb line and a measured pole or steel tape. In case of very large or deep sewers the details may be varied to suit the case in hand.

The grade line having been established and the contractor ready to begin, the engineer (unless he has no other employment) will need a competent and reliable inspector to see that the materials are what have been agreed upon. And upon this same inspector rests a large part of the burden of securing an excellent piece of work. He must be ever present and ever watchful, or something may go wrong, and after lying buried for years, perhaps, that wrong spot will show itself in some way to bring discredit upon both engineer and inspector. He must see that each pipe is sound and true before it is lowered to the bottom. He must know that the pipe to follow will fit well to make a true and smooth water line, even if the two pipes are not exactly concentric.

He must see that the cement is good and properly mixed. He must see that each pipe is laid to line and grade, the joint carefully made with cement all around the pipe, and not disturbed until it is well filled around and over. He must tell the pipe layer at least a hundred times a day to tamp well around the pipe and to wipe it out so as to remove loose cement or sand which may be inside, and finally cleared of all rubbish. He must measure to locate each Y branch or house connection from the nearest manhole. He must look to it that the manholes are built true in form, smooth in inside finish, well plastered on the outside, steps built in at the proper distance. He must see that the trench is filled, tamed or puddled, and left in good condition for travel. So much care at least must be given to the pipe sewer to insure anything like a good job.

In building a brick sewer even more details are to be looked after and greater skill required on the part of builder and overseer than in the case of a pipe sewer. Some one must be on the work to note the character of the foundation as the digging progresses, for a good piece of brickwork, built on a poor foundation, is no better that a poor one, and there is no better time to see what may be needed in the foundation than when the excavation is going forward. Some one must be on hand to see that the timber foundation, or whatever may be used, is properly placed and secured. Then there is care to be taken in setting the profiles or forms for the brickwork; in noting the quality and mixture of the cement; in selecting the hardest, smoothest and best bricks for the invert; in watching the masons to see that they lay each brick to the line with a full mortar joint, and without unnecessary pounding or pushing after it is in place to break the bond of the cement; in having the bricks wet in dry weather and not too wet in wet weather; for cement hates a dry brick and will not cling to it, nor can it hold a soaked one to its place. Then care must be taken in setting the slants for house connections, lest they have insufficient support at the back and are not able to stand the weight of the earth on top.

The arch must be turned on a good and true centre in lines parallel to the axis of the sewer, and so spaced that a full number of courses will make the arch without splitting a course. The earth must be filled in and tamped solidly at the haunches to keep the arch from cracking, and at the same time so placed as not to tear off the plastering on the outside. If there is inside or second sheeting, some one must see that it is drawn above the crown of the arch before filling, for there will most likely be a crack in the brickwork if it is left to be drawn afterwards. In case of water in the trench great care must be used to keep it

*A paper read by F. Floyd Weld, President of the Connecticut Association of Civil Engineers and Surveyors, published in the Transactions of the Association

away from the brickwork until the cement is thoroughly set. I never yet saw a contractor who would voluntarily keep water from flowing over the freshly laid invert, even if the water could easily be taken care of, and would be a nuisance to the mason if allowed to run, and would make him more expense in repairs and delays than the cost of pumping or bailing.

Manholes must be laid out with care to have the foundation firm and substantial, the injunctions for lateral sewers built in a smooth and workmanlike manner, the head of the sewer cut in good shape, and the walls carried up to the surface in a symmetrical and smooth piece of work. Finally the sewer should be left clean, free from all rubbish, loose cement, brick chips, sand, mud, or other accumulations. And now, having built our sewers with some considerable care and attention, shall we consider the duty of the engineer done, his occupation gone so far as these particular sewers are concerned, and the sewers no longer in need of supervision from any one for all time to come? I think not. The work of building is over, but the work of running the machine is to come. It would be as reasonable to expect a complicated piece of machinery to care for and run itself as to expect a system of sewers to do their duty without some intelligent oversight. A perfect sewer, used always with the utmost care, with a stream of water of constant and ample volume flowing through it, might need no care for a number of years, but perfection in this world of sewers is rarely attained, and a steady flow of water is not always to be had.

As with persons, "Cleanliness is next to godliness," so with sewers, cleanliness is next to success. A dirty sewer is an abomination, and if allowed to continue dirty is a failure. It all depends upon the care and oversight given to sewers whether they shall be clean or dirty, whether they shall do in a regular and continuous way the work they are designed to do, without offense or danger to the people, or shall fail to carry off promptly the refuse from our homes, and so become a receptacle of filth, disgusting to clean out and a nuisance to health.

There is nothing like water to keep sewers clean. If there is a lack of it the heavier parts of the sewer settle to the bottom, to cling there to decompose and send off noxious gases. This trouble is most often found in the separate system on lateral sewers, or on the ends of main lines where but few houses are connected. A flush tank at the end of such lines, arranged to discharge several hundred gallons at intervals of four, six or even twelve hours, will usually keep the pipe clear. If an automatic tank is not used, frequent flushings from a hydrant or from a portable tank on wheels is very effective. Sometimes, on light grades, even where there is a good flow, it becomes necessary to clean out the sediment, and oftentimes a flush of water is not sufficient. In such cases scrapers or brushes have to be employed. I have used, with very good results, a scraper made of two wooden disks, between which a flange of rubber is bolted.

The rubber fits the pipes and is drawn from one manhole to another by a rope, the rubber being flexible enough to easily pass any inequalities in the pipe. Where street water is admitted to the sewers the cleaning is sometimes quite an item; for in spite of traps on catch basins some sediment will be carried over by the rush of waters in heavy storms, and will settle at the light grades. To remove this, something more than water is necessary at times. I have used on large pipes and small brick sewers a metal scraper, made of galvanized iron, shaped like a tube, with one end funnel shape, and the other pointed. This is drawn from manhole to manhole by a rope, and raised to the surface by a small derrick. Where the sewers are large enough to admit a man, the cleaning of sand or heavy sediment can best be done by using a wheeled truck, adjusted to fit the bottom and sides of the sewer. This truck carries buckets, which, when filled, are lifted to the surface.

In making connection with the sewers care should be taken to see that the pipe is properly fitted and jointed with the branch left for such use. Neglect in this respect makes much trouble for those in charge of sewers. Mud and sand often come in from an opening made to connect with a house, because it is easier to let it run into the sewer than to bail it out. Unless there is some system of license and permit for connections, and inspection of work, there will be frequent tappings of sewers at places other than the proper branches, with the attending results of broken sewer pipes, mutilated brick sewers, and pipes projecting inside to make stoppages. Careless work of this kind has been known to almost ruin a system of sewers. It happened where it was thought no one was needed to look out for sewers after they were once built.

The best of care on the part of those in charge of sewers will not permit misuse of them by others, and a complete choking of small pipes may result from the admission of sand or improper articles to the sewer from occupied houses or cellars in course of construction. In case of stoppage, prompt action is imperative to prevent damage to adjoining property. A useful implement to have is a rod for cleaning.

Water pipe, one inch in diameter, cut into lengths short enough to be handled in a manhole, may be cut with a screw thread on each end, to be joined together with a union. These pieces fitted together, will make a good rod for forcing an opening through the obstruction, and will usually start a flow of water which will gradually enlarge the opening until the sewer is cleared.

Where storm water is taken into the sewers, the catch basins need attention from the same person who has the care of the sewers; for the basins are a part of the sewer system, and should be cleaned frequently and with care, to work in harmony with the whole. The less sand found in basins at the beginning of a storm the less sediment found in the sewers at the end.

Sewers will wear out in time; but a careful inspection of all weak and hard-used places, with a little work here and there, will prevent a break, perhaps, and save many times the cost of such inspection and work.

DELEGATES TO THE NINTH ANNUAL CONVENTION.

Following is the list of delegates to the Ninth Annual Convention of the National Association of Master Plumbers to be held at Cincinnati June 23, 1891.

CHICAGO, ILL.—*Delegates*: J. J. Wade, Daniel Rock, T. C. Boyd, Andrew Young, T. P. Culloton, M. L. Mandable, P. Rediske, Wm. Bowden, R. C. Miller, J. Webber, P. Sander, J. Matthews, Hugh Watt.

NEW YORK CITY.—*Delegates*: Henry G. Gabay, President; George D. Scott, John Byrns, Joseph A. McDonald, James N. Knight, Frank Reynolds, William H. Quick, Thomas J. Toumey, Wm. H. McDermott, John Mitchell, Charles H. Kranichfelt, Timothy Sullivan, Edward J. Brady, William Young, Joseph W. O'Brien, James Gilroy, Terrence J. McCormack, Phillip Smith, Daniel W. Littel, Edward Murphy, John Miller, Michael J. McDermott, Thomas J. Cummings, Owen McGinnis, Ed. J. O'Connor, M. Ryan.

KANSAS CITY, Mo.—*Delegates*: L. B. Cross, President; D. M. Quay, J. L. Ryle, Thomas Farley. *Alternates*: R. B. Farley. James Bewsher, Dent Yates.

PHILADELPHIA, PA.—*Delegates:* John E. Eyanson, President, John J. Weaver, Wm. Harkness, Wm. M. Wright, Wm. M. McCoach, Geo. F. Uber, F. P. Brown, W. H. Doyle.

KANSAS STATE —*Delegates*: C. J. Prescott, Topeka; James Foley, Leavenworth; John Shehan, Topeka; A. H. Nooney, Topeka; A. T. Buckridge, Wichita. *Alternates*: Thomas Lloyd, Kansas City, Kansas; H. Ingham, Ft. Scott; Robert Wood, Topeka; G. C. Hargreaves, Kansas City, Kansas; J. H. Beasley, Pittsburg.

BROOKLYN, N. Y.—*Delegates*: Wm. J. Fitzpatrick, Chairman; Wm. J. Gault, Secretary; M. J. Lyons, George Cummings, Thomas H. Radcliffe, George B. Lewis, Martin Fallon, H. M. Noble, John Danaher, G. A. Smith, Joseph Zoll, Wm. H. Heron, Wm. Donivan, John J. Keenan, James Travers, Patrick Dunn, Bernard McBride, O. O. Sawkins, Wm. Keegan, M. J. Farrell, J. C. Gunning, John McConnell, John Gannon, Wm. J. Roche, Wm. C. O'Kiffe, E. McDonald, John Bosch. *Alternates*: Owen Marrin, James McManus, Wm. J. McCaw, John H. Read, Paul Ayres, D. J. Thatcher, F. J. Firth, R. J. Knox, Charles Sheppard, P. H. Bennett, J. W. Bliss, Thomas C. Curtis, D. Covert, I. W. Dean, J. J. Dillon, E. Dyer, Wm. Donaghy, D. Gateson, F. J. Gatley, M. F. Gleason, Jas. Husssey, Wm. Heslein, Jos. Logan, Wm. McDonald, Thomas Munckenbeck, John Newman.

Cleveland, Ohio.—*Delegates*: Wm. H. Henderson, W. A. Kelly, Adam Schneider.

St. Paul, Minn.—*Delegates*: W. J. Freaney, J. T. Homes, J. J. Dunnigan.

Baltimore, Md.—*Delgates*: John Trainor, Chairman; Daniel J. Barry, Daniel Sullivan, William Dunnett, George Knipp, Joseph Mitchell, William Rothrock.

Boston, Mass.—*Delegates*: Thomas J. Tute, Daniel Shannon, Dennis A. Horgan, Wm. N. McKenna, Joseph H. Baguley, Chas. M. Bromwich, Wm. H. Mitchell, Henry W. Tombs, David Smith, Daniel G. Finnerty, John P. Conlon, Frank A. Titus, J. W. French *Alternates*: Isaac Reilly, Wm. Lumb, James Tucker, James Davlin, John K. Tully, George W. Wilson, Edward Moore, George C. Forbes, Michael J. Keane, Florence Sullivan, John W. Cosden, Thomas H. McDonald, John S. Boyd.

Washington, D. C.—*Delegates*: Joseph R. Quinter, Donald Williams, Frank N. Devereux, Julius I. Atchinson. *Alternates*: Edward J. Hannan, James Lockhead, John Mitchell, Robert G. Campbell.

Bridgeport, Conn.—*Delegates*: Zalmon Goodsell, Gerhard Drouve, James Logan, L. H. Mill.

St. Joseph, Mo.—*Delegates*: J. W. Powers, R. T. Connell.

Evansville, Ind.—*Delegates*: Alexander Crawford, Chas. Wahnseidler.

St. Louis, Mo.—*Delegates:* James Lancaster, O. J. Gerhardt, J. Sheehan, P. H. Callahan, Wm. Norris, T. McLaughlin, E. P. Reardon, M. J. Ward, John Mahon, Joseph Tumalty, Wm. Schwehr, Wm. Morris, J. F. Reardon, P. Madden. *Alternates*: D. J. Collins, J. Shelley, Wm. Mortimer, John Grenzeback, C. H. Carroll, J. M. Life, J. Manchester, Wm. H. Kuhns, A. J. Wilke, G. F. Eckhardt.

Buffalo, N. Y.—*Delegates:* Chas. Geiger, J. L. Mensch, L. P. Beyer, J. S. Stygall, Jr., C. B. Huck. *Alternates*: Dean Wilson, Thomas Kavany, F. C. Kamprath, John McGory.

Portland, Ore.—*Delegates:* August Donnerberg, Fred Martin. *Alternates*: Thomas Varwig, Robert Brady.

Denver, Colo.—*Delegates:* Jos. P. Ratican, President; W. H. McKelvey, John R. Parry, Archie Davis, M. McIntire, W. Delaney, W. F. McCarthy.

Pittsburg, Pa.—*Delegates:* Allen McFadden, President; John M. Tate, F. P. Blythe, James G. Weldon, I. K. Becker, James Hay C. H. Humburt, John Cowley B. F. Coll, S. W. Hare, J. J. Kennedy, R. J. Bradshaw:

Texas State.—*Delegates:* F. J. Madden, President; D. F. Sullivan, D. J. May, A. H. Shafer, Geo. Mummert.

Syracuse, N. Y.—*Delegates*: M. Kennedy, Chas. G. Hawchett, Wm. Tobin. *Alternates:* P. J. Dunn, A. Tilly, E. Joy.

Cincinnati, Ohio.—*Delegates*: Chas. T. Murray, Fred Lamping, J. R. Gibson, E. J. Nolan, Thomas McNeil, James A. Gibson. *Alternates:* Chas. Homan, Henry Weilert, George Douglas, Charles Weber, William F. Wagner, William F. Gibson.

Rochester, N. Y.: *Delegates*: W. G. Reid, President; George Heniger, Wm. Ball, James O'Conel, I. Morgan. *Alternates:* John Creelman, Wm. Tannel, Wm. Rewin, D. Bascom.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The improvement continually going on in the production of smokeless and fuel-saving furnaces indicates a great activity in this line, and is a recognition of the importance on inventions in this regard. The producers of any article for the market reflect pretty well the public mind and indicate to a great degree the demand. Judging from this it is seen that the smoke nuisance and waste of fuel have created a general desire for a purer atmosphere and more perfect combustion. It does not seem that the manufacturers need be at all uncertain regarding the disposal of any device that is effective in the service the public desires. The action of municipal governments in passing ordinances providing protection against the smoke nuisance still further vindicates public sentiment on the subject and should encourage invention and manufacture in this regard.

The sentiment in favor of a pure atmosphere and against the unwholesomeness of the smoke nuisance has taken decided shape in Pittsburg. This city having once experienced cleanliness in this regard cannot view the return to coal consumption without taking some steps to provide for its usual accompaniment of smoke. The definite shape into which this sentiment is formed is found in the Women's Health Protective Association which has initiated a crusade in favor of compelling the use of smoke consuming devices. This association will bring a test case against manufacturers or others who create a nuisance. They have already induced several parties to employ smoke consumers and their efforts bid fair to rescue their city from obscurity by smoke.

An exchange says: "That the importance of a smokeless fuel to the public in general and to the manufacturer in particular is recognized, is shown by the fact that new methods of producing it are constantly being devised. A product of this kind has been tested in England with promising results. The fuel consists of dust or waste coal reduced to a fine powder, and then incorporated with a small proportion of pitch and some other mineral substances to the extent of from 7 to 10 per cent., according to the nature of the coal used. It is then, while in a plastic condition, moulded in presses, where it is submitted to a pressure of two tons to the square inch." Other experiments of the same kind are reported, but we cannot see the economy in the use of fuel the price of which has been thus increased. If, as has been demonstrated, the natural product can be burned in proper furnaces without producing smoke, and at the same time decreasing the cost of fuel, what is the use of throwing aside the furnace and resorting to a high-priced fuel? Perfect combustion may no lower the price of coal, but it will lessen the amount consumed. Taking the abatement of the smoke nuisance as the object of prime importance to be attained, the cheaper this can be done the more effectively and easily will it be accomplished. If we can lessen the amount of smoke and at the same time reduce the amount of fuel consumed, we are most sure of success; for then it will be expensive to make smoke. As it has been shown that the smoke nuisance can be fairly abated by more perfect combustion, it would seem that, instead of devising a new, costly fuel, we should profit by the use of devices which would render the decrease of smoke an increase in economy.

We find other arrangements made by which smoke is treated in different ways for the purpose of settling and retaining in some receptacle provided, the unburned particles or charred substances which become so offensive when allowed to contaminate the atmosphere. The contrivances are more or less successful to a certain degree, but they all tend in the wrong direction, and necessitate an additional expense while the waste of fuel is rather increased than lessened. It costs something to run fans, water sprays, steam jets and the like, and with this expense the result is sought to be secured which should be accomplished in the furnace. In other words it is better to prevent the making of smoke than to hide it after it is made. If this be accomplished in the furnace or by devices, then the end sought will be attained at a decrease instead of an increase of expenses.

We cannot tell what a year or day may bring forth. Invention and discovery are ever busy, and a fuel not dreamed of now may in a short time supplant the products now used as such. Electricity, which has made such wonderful strides in the last decade, may revolutionize power and heating and relegate to obscurity the methods now in use; but as we stand at present we must provide for what we have, and make the best of it. The oil, gas, and other fuels which have been introduced in comparatively recent days, may aid in the solution of the smoke problem, but with their introduction we find a new problem for solution and one more serious. The explosions and conflagrations, the destruction of life and property present grave questions for consideration, among which may be placed the extent of the supply. Whatever other fuels may be or do, we know the apparently unlimited supply of coal and its safety and efficiency as a fuel. It improperly handled leaves us smoke and the ills attending it. But when we know how to consume this fuel perfectly, we will have solved a great economic problem and abated the smoke nuisance at the same time.

The following is the disposal of the smoke nuisance cases on last Wednesday: H. R. Graham, 111 State street, fined $50 and cost; F. P. Owings, Adams and Dearborn, fined $50 and cost;

Bunte Bros. & Spoehr, 141 W. Monroe, fined $50 and cost; Crane Co., Fulton and Desplaines, fined $50 and cost; Western Electric Co., 257 Clinton, fined $50 and cost; Young & Farrell, 30-32 W. Polk, fined $50 and cost; Winslow Bros. Co., 396 Carroll ave., fined $50 and cost; National Brewing Co., 846-856 W. Eighteenth street, fined $50 and cost; Keenan Bros. Mfg. Co., 545 W. Taylor, fined $50 and cost; Coit & Co., 35 W. Washington street, fined $50 and cost; John V. Farwell Co., 146-178 Market, fined $50 and cost; American Steam Laundry, 107 N. Clark, fined $50 and cost. A number of other cases was continued one week.

CONVENIENT TO HAVE ABOUT.

Diluted muriatic acid will take the muddy deposits out of gauge glasses.

Papier-mache oil-cans which are now being made, are very durable and impervious to any spirit or oil likely to be used in a machine room.

To get a good polish on mahogany easily: Mix one part of boiled linseed oil with two parts of alcoholic shellac varnish. Shake well before using. Apply in small quantities, with a cloth, and rub the work vigorously until the desired polish is secured.

In brazing file the edges clean and bright; cover with spelter and powdered borax, and expose in a clear fire to a heat sufficient to melt the solder.

To bronze copper, clean the surface, then brush it over with a solution of sulphate of iron, acetate of copper, or peroxide of iron; heat it cautiously and gradually, rub off the powder and examine. If not a good bronze color repeat the process.

For bronze paint for iron take ivory black one ounce, crome yellow one ounce, crome green two pounds. Mix with raw linseed oil, and add a little Japan to dry it.

For brassing small articles take one quart of water and add half an ounce each of sulphate copper and protochloride of tin. Stir the articles in the solution until the desired color is obtained. Use the sulphate of copper alone for a copper color.

To frost brass work, boil in caustic potash, rinse in clean water, and dip in nitric acid till all oxide is removed; then wash quickly, dry in boxwood sawdust, and lacquer while warm. This will give brass an ornamental finish.

For washing brass with tin boil together six pounds of cream tartar, four gallons of water and eight pounds of grain tin or tin shavings, for half an hour in a porcelain-lined vessel; put the clean brassware in the boiling liquid for a few minutes or until properly coated.

Tin and tin alloys, after careful cleansing from oxide and grease, are handsomely and permanently bronzed if brushed over with a solution of one part of sulphate copper (bluestone), and one part of sulphate of iron (copperas) in twenty parts of water. When this has dried, the surface should be brushed with a solution of one part of acetate of copper (verdigris) in acetic acid. After several applications and dryings of the last named, the surface is polished with a soft brush and bloodstone powder. The raised portions are then rubbed off with soft leather moistened with wax and turpentine, followed by a rubbing with dry leather.

French method of coloring bronze or brass: The bronzing shows all the tints from a dull yellow to reddish brown, red and almost black, and adhere thoroughly to the metal. The method of manufacture was long kept secret, and the other receipts generally known to prepare such colors never yield such good results. It now appears that the secret lay in the use of solutions of sulphides of antimony and arsenic, which were applied to the bronze or brass articles. After thoroughly washing them with water, since every trace of acid left in picking would show black spots, they are thoroughly dried, and then the sulphide solution is applied with a brush. The best way is to begin with a dilute solution of ammonia, giving one application. After drying, the coating is brushed and then the dilute solution of sulphide of arsenic in ammonia is used, which produces a yellow color. The oftener this sulphide of arsenic is applied the browner will be the color, and a deep tint may thus be finally obtained. By solutions of sulphide of antimony, either in ammonia or in sulphide of ammonia, the tint is reddish, and it is possible in this way to obtain either the most delicate red or the deepest dark red. If some of the parts of the article are rubbed more strongly a high metalic-lustre is obtained. Ammonia or sulphide of ammonia reabsorbs the bronzing, and in this way defective spots may be improved. It is possible also to use solutions in caustic soda or potash or the sulphide of either.

To imitate old bronze the repeated applications to copper or brass of alternate washes of dilute acetic acid and exposure to the fumes of ammonia will give a very antique looking green bronze, but a quick mode of producing a similar appearance is often desirable. To this end the articles may be immersed in a solution of one part perchloride of iron in two parts of water. The tone assumes darkness with length of immersion, or the articles may be boiled in a strong solution of nitrate of copper. Lastly, they may be immersed in a solution of two ounces nitrate of iron and two ounces hyposulphite of soda in a half-pint of water, washing, drying and burnishing complete the process.

HEALTH IN MICHIGAN, MAY, 1891.

For the month of May, 1891, compared with the preceding month, the reports indicate that cholera infantum, cerebro-spinal meningitis, cholera morbus, inflammation of brain, puerperal fever, and inflammation of kidney increased, and that membranous croup and diphtheria decreased in prevalence.

Compared with the preceding month the velocity of the wind was slightly less, the prevailing direction was northeast (instead of west and southwest), the temperature was higher, the absolute humidity was more, the relative humidity was less, the day ozone was more and the night ozone considerably less.

Compared with the average for the month of May in the five years 1886-90, influenza was very much more prevalent, and typho-malarial fever, whooping-cough, diphtheria, remittant fever, membranous croup, intermittent fever, dysentery and cerebro-spinal meningitis were less prevalent in May, 1891.

For the month of May, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was slightly less, the prevailing direction was northeast (instead of southwest), the temperature was slightly lower, the absolute humidity and the relative humidity were less, the day ozone was more and the night ozone was slightly less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of May, 1891, at forty-six places; scarlet fever at sixty-four places; typhoid fever at seventeen places, and measles at eighty-nine places.

Reports from all sources show diphtheria reported at five places less; scarlet fever at fifteen places less; typhoid fever at three places more and measles at fifteen places less in the month of May, 1891, than in the preceding month.

Henry B. Baker, Secretary.

Lansing, Michigan, June 4, 1891.

LET THE GENTLEMEN SAY SOMETHING.

Cleveland, O., June 8, 1891.—Editor of The Sanitary News: I would advise Mr. A. Vallentine to study a little, and he will find that it is not the so-called vent system that is under discussion, but the vent system and it is not the practical men who scoff at it, but the so-called practical men. Let those men who scoff at the system give us their ideas and they may teach us something that we don't know. They do a good deal of howling, but so far they have said nothing. I would like to hear some of their objections. There are a great many more besides Mr. Vallentine who would like to see that Sanitary News poet killed, but you will find them among the tinkers and the so-called practical men. I think he must have struck Mr. Vallentine and the latter is acting in self defense; but like the mouse with the cat he is helpless, poor fellow. Mr. Vallentine or any of his authorities are welcome to open up a discussion on this subject or anything relating to plumbing and house drainage. My object in writing in answer to Mr. Vallentine is to get him to say something.

Yours respectfully,

W. A. Kelly.

DEATH OF WILLIAM WILSON.

It is our sad duty to record the death of Mr. William Wilson, an esteemed brother and upright man. His sudden taking off is a matter of regret and sorrow to all who knew him, and his

departure will leave us a mournful memory of an honorable and lovable brother. His death on the 4th inst. was the result of an amputation made necessary by a fall in which he received a compound fracture of a lower limb. The shock was more than he could stand, and as a result, we to-day mourn his loss.

On Friday following his death David Whiteford, president of the Chicago Master Plumbers' Association, issued the following call:

Dear Sir: A meeting of the Master Plumber's Association will be held at the store of E. Baggot, No. 189 E. Adams street, on Saturday, June 6, 1891, at 6:30 P. M., to take action in regard to the death of our late brother, William Wilson. A full attendance of the members of the Association is urgently requested, when all arrangements will be made to attend the funeral of our deceased brother, which will take place from his late residence, 4346 Langley avenue, on Sunday, June 7th, at 10:30 A. M.

The meeting was largely attended, arrangements for the funeral made, and appropriate addresses were made by Messrs. Baggot, Wade, Boyd, Carboy, Dowden, Griffith, Whiteford, Hamblin, Murry and others. The meeting reflected the sentiment and sympathy extended under the sad occasion, and gave evidence of the esteem in which the deceased was held. The funeral took place on Sunday and the interment at Rose Hill was attended by the Chicago Master Plumbers' Association, Nineteenth Illinois Infantry, Post 28 G. A. R., and numerous friends and acquaintances.

Mr. Wilson was a man to be esteemed in life and in death he is deeply mourned. He was a gallant soldier; went through the war in the Nineteenth Illinois regiment, was an able debater in council, of rare judgment, of a happy genial disposition, one of the earliest members of the Chicago Association, took an active part in conventions, and was an upright, honorable man and a good citizen. His many friends among the plumbers will mourn the loss to the trade of such a man, and his place will be difficult to fill. Personally the writer has known him since 1857, and can bear testimony of his many good qualities, and the consolation left us in his death is the lesson taught by his upright, manly life which we can all emulate to our own advantage and the good of our city.

FOR THE DIGESTION.

"Yes" said the theatrical manager; "we do need a good Spanish dancer. What steps do you take first?

"What steppa do I take da fir-r-rst? Getta da advertise ina da pape. Datta da fir-r-rst steppa!"

She was engaged.—*Smith, Gray & Co.'s Monthly.*

American (oracularly)—You English have no sense of humor. Your idea of a joke is something ridiculous.

Englishman—Pon me word—I thought that was also the American idea of a joke.—*Brooklyn Life.*

Poet: How much ought I to get for that poem?

Editor—Oh, I should think about ten—

Poet (with a sickly smile)—Yes; I know what you are going to say: 'Ten dollars or thirty days."

Editor—No, sir; ten years.—*Judge.*

The man who talks in his sleep is not as much of a nuisance as the man who sleeps in his talk.—*Boston Courier.*

"This might be called clearing the deck for action," mused the poker-player, as he sequestered all the aces.—*Indianapolis Journal.*

"Are you in favor of cremation?" he inquired in the hope of stimulating talk. "Yes," she replied, "ice-creamation."—*Washington Post.*

The man who does not complain makes more friends than the man who always has a grievance. The dead martyr is the only kind that is ever canonized.—*New York Recorder.*

He (suddenly)—"Do you think the minister will want to kiss you?" She (pleadingly)—"Let him if he wants to, Harry. He's just grown a beautiful mustache."—*New York Continent.*

If a man knows when he is well off he won't die as long as he can help it. Barnum has been dead only a few days, and one man is claiming all the credit of the sale of his book, and another the credit of his advertising methods, while another calls him old Skinflint, and says he never gave a dollar to charity. Truly, the old legend may be true—not a man dies who doesn't remark after crossing the Styx, "I want to go back and lick somebody."—*Judge.*

"Yes, you are quite right; that Mrs. B——, the Councilor's wife, is a silly, stuck-up person, a regular bluster horn!" [Enter Mrs. B——.] "Ah, Mrs. B——, so delighted to see you; we were just talking about you?"—*Lustige Blatter.*

Mrs. Wickstaff—"My dear, this ribbon you have brought home for Fido is a shade too light." Wickstaff—"All right. I'll try it over." Mrs. Wickstaff (the next day)—"My dear, I'm sorry, but the ribbon you have brought home to-day is a shade too dark." Wickstaff (wearily)—"Then wait until to-morrow and I'll change the dog."—*Cloak Review.*

"Do you believe man sprang from the ape?" "No; but I believe woman springs from the mouse—in fact I've seen her do it. —*Harper's Bazar.*

Fashionable women who go to fashionable balls are more afraid of what the reporters will not say about them than of what they may say.—*New York Recorder.*

The quickest way to lose your place in the affection of the man who says he doesn't care for admiration is to stop telling him the pleasant things you hear about him.—*Elmira Gazette.*

"Time brings strange reversals. There's poor old Henpeck, for instance, who married his typewriter." "Well, where does the reversal come in?" "Why, it was *he* used to dictate."—*Life.*

"I see your paper has committed itself to the Prohibition party."

"Yes," returned the editor; "worse luck. I had to go away last week and the man I left in charge got roaring drunk and wrote that editorial.—*Judge.*

Hitch—"What was Dr. Fourthly's text this morning?" Dickey Hitch—"I knew you would ask, so I put it down: 'The Lord tempers the wind to the spring lamb.' "—*New York Herald.*

The Judge became preacher and when he married his first couple he said: "I pronounce sentence on you as man and wife, and May God have mercy on your souls." The culprits left happy —*Detroit Free Press.*

"Snip," said the tailor's dude customer, "measure me for a $10 outfit. I'm going to act the poor man hereafter." "O, I hope it's not so bad as that?" "Yes, I'm determined. I'm going to pay for this suit."—*New York Continent.*

"You are out of date," said the hair mattress to the feather bed. "I may be a little old-fashioned, but I am no hairy tick," replied the feather bed. After which retort it laughed until it dropped down on the floor.—*Indianapolis Journal.*

PLUMBING NOTES.

The Board of Directors of the streets and the Sewer Department of Wilmington, Del., at their recent meeting adopted rules and regulations governing plumbing in that city.

The plumbers's lock out, which has lasted nearly eleven weeks, at Fall River, R. I., has been virtually ended, all but three of the thirty plumbers now being at work on a 53 hour per week schedule.

In the *Western Architect and Building News* for May, the Hughes & Keith Sanitary Supply Company, 1647 California street, Denver, Colo., receives quite a lengthy and complimentary notice regarding the character of work performed and material supplied.

The Master plumbers of Minneapolis have conceded the eight hour demand, with wages at $3.50 per day.

The *Evening Wisconsin* says: It is asserted by the master plumbers that the journeymen plumbers' strike terminated in a virtual victory for the bosses, and that the journeymen, many of whom have returned to work, did so with the full understanding that the shops in which they are employed are to be non-union shops. They say also that no conference was held between representatives of the union and of the Master Plumbers' Association, that although the master plumbers received a communication from the union asking for such a conference they did not reply, bvt all along refused to entertain any proposition to compromise coming from the union officers. There were about 120 plumbers

involved in the strike, and a large proportion of them have returned to work.

The journeymen plumbers who were locked out admit that their union has collapsed, but they say that the bosses have conceded their demand that eight hours shall constitute a day's work, and have also advanced wages so that first-class men will hereafter receive from $3 to $3.50 per day, and second-class men $2.25. This is an average increase of 25 cents per day.

A plumber sat downcast and sad
Looking his cash book o'er;
He had cut prices awfully bad
And his heart and pocket are sore.

Secretary H. T. Bush, 34 Geary street, on behalf of the Master Plumbers' Association of San Francisco, Cal., is sending out the following letter to the master plumbers of the Pacific Coast:

At a meeting of the Master Plumbers' Association, held in their rooms at the Pioneer Building in San Francisco, on Monday, April 13, 1881, a committee was appointed to correspond with the master plumbers in the cities and towns of the several states on this coast, inviting them to form an organization with the aims and purposes hereinafter set forth, and to affiliate with our association, or if there is not a sufficient number of master plumbers in your city or town for such an organization, then to join with us here. Our organization is a part of the Master Plumbers' Association of the United States, and we act in accord with them.

The object of our association is for mutual protection. Our aim in sending out this communication is to get, if we can, all the master plumbers in the towns and cities of the several states of the Pacific Coast to co-operate with us, and to request the wholesale dealers in plumbers' supplies, etc., with places of business in San Francisco and in all our larger cities on the Pacific Coast to sell to the trade only.

Under the present state of affairs, one who is in no way engaged in the plumbing business can come here from any town and buy plumbers' materials just as cheap as we all can; he can take them home with him, put them up himself or hire some one to do so for him, thereby making you the loser of a profit which you are entitled to, and which you would have received if the wholesale dealers did not retail. This has been going on for many years, and it is about time it was stopped. You will readily see how necessary it is for all of us to organize into one solid band for our mutual protection, and the sooner we do so the better. From careful inquiries we learn, and we are sorry to say, that on the Pacific Coast is the only place where wholesale houses dealing in plumbers' supplies sell at retail. We have so far met with almost universal encouragement in this city and neighboring towns, and now, if you are ready to act with us, it will only be a matter of a very short time when the results of our united labors will be beneficially felt. All we ask is that you interest yourselves and your fellow masters in this matter as soon as possible, and let us hear from you and get your views. We hope that we have made the object of our association clear to you, and that you will look at it as we do. Any suggestions you would like to make, or any information you may desire, we will be pleased to receive and give.

And now comes Mr. Vallentine
Who wants to kill the poet
He couldn't kill a half a bare
And well he ought to know it.

Back venting is a subject that
The poet will discuss,
With all the tinkers in the world
Who fizzle, fume and fuss
About a thing they know not of
And should remain quite dumb,
Or else serve out apprenticeship
In learnimg how to plumb.
The poet read his letter through
With many an ache and groan and sting;
And while he is disfigured some,
He still is in the ring.

A letter publish elsewhere from Mr. W. Kelly sets the matter of venting before the public in its proper light. Proper venting is meant not the "so-called" venting; and real practical men, not the "so-called" practical men. On this issue the practica men will meet the "so-called" practical men.

Many subscribers have asked who was meant in the article on "Cutting Prices" in our last week's issue. In replying to these questions we say, you.

We are in receipt of ordinances regulating plumbing and house drainage of Green Bay, Wis., with the compliments of H. J. Spencer, Inspector. The ordinance is prepared with care and follows out the demands for sanitary plumbing.

In reply to a letter sent Mr. James Madden, the enterprising plumber of Fort Wayne, Ind., and the efficient Vice-President of that state, we received the following: Mr. Andrew Young: I have yours of the 3rd inst., and in reply would say that I am glad to hear of you assuming the management of THE SANITARY NEWS. While that paper has in a measure, been faithful to the interests of the craft, its index, illustrations, and pages in general, have lacked much that the older and more interested members of the trade desired in a live, Western trade Journal. I am amongst the first subscribers and have never missed a number, and you can depend on me for support while you are in any way directly or indirectly attached to it. I have always been a friend to every publication in the interest of the trade and very few have a subscription list without my name, in the last sixteen years, or since the first publication of the *Sanitary Plumber* now the *Engineer and Building Record*, and I assure you of a stronger friendship towards THE SANITARY NEWS since you have become its manager, and I hope for, and have no doubt of your handsome success, as I think you are the man for the place, and if you don't succeed there must be lots of ingratitude in the trade.

Whenever your plumbing is out of repair,
Or you have cause to suspect it,
Lose no time but go straightway
For a plumber to inspect it.

WHERE PLUMBING WORK IS BEING DONE.

6446 Aberdeen street, J. J. Doyle; 64-66 Artesian ave., C. H. Russell; 5233 Ashland ave., C. Whitney; 845 Ashland ave., J. Hois; 129 Albany ave., Jurgensen; 95 Aberdeen, Jurgensen; 810 Ashland ave., F. Falk; Adams and Leavitt, D. Jack; 393 Bowen ave., M. Anderson; Bonfield near Archer ave., J. Watson; Centre, Rediske; California near Twenty-second, W. Danal; Carpenter near Sixty-seventh, Conrath; California near Twenty-first, C. Kostlevy; 2516 Canal, M. Weber, Centre and Paulina, V. Voltz; 115 Clarence, V. Voltz; 2303 Commercial ave., Filtman; Clinton near Clark, C. T. Kirk; Clarence and Grace, Bletch; 107 Canalport ave., C. Kostlevy; Cook and Sixty-first, D. T. Dewar; 577 Dearborn ave., Val Ruh; 1512-22 Dunning, F. W. Gruschow; 46-48 DeKalb, J. Watson; 3645 Dearborn, E. Hennessey; Diversy near Lincoln, H. Bauer; Division near Shober, F. Falk; Division and Wood, F. Falk; Dickey and Seventy-first, D. T. Dewar; Ewing and Halsted, Nash & Hanna; 5232-34 Emerald ave., C. Kostlevy; 4727 Evans ave., P. B. Finn; 97 Evergreen ave., Nelson & Ceelhoffen; 170 Fifty-third, J. J. Rourke; Fifth-fifth near Jefferson, Shea & O'Brien; Fulton and Union Park Place, McDonald; Forty-fourth and Armour, Corwaths; Forty-eitgth and Throop, Sherman & Bennett; 3635 Fifth ave., Collins; 141 Fourteenth, C. Kostlevy; 106 Fremont, M. Bauer; Forest and Kemple, S. H. Bauer; 500 Fulton, D. Jack; 637 Flournoy, Harvey & Mose; Green near Sixtieth, Conrath; Grand boul. and Forty-first, O. Hennessy; 335 Halsted, Nash & Hanna; 235 Huron, Gruschow; Halsted and VanBuren, P. Robinson; Humboldt boul., Geiss; Halsted and Sixty-sixth, D. T. Dewar; 169 Humboldt ave., Harvey & Mose; 359 Jefferson, E. M. Hacket; 20 Johnson, Kostlevy; 5425-27 Jackson ave., E. Hennessey; 5514 Lake ave., J. J. Clark; 2801 Lowe ave., M. Weber; 78-80 Mohawk, C. Rediske; Menominee, C. Rediske; 291 Monroe, Hamblin & Co.; Maxwell and Newberry, Daniel & Co.; Mound ave., near School, Conraths; Noble and Blackhawk, S. Klein; 78 Ninty-first, Brunt Bros.; 1500 Noble ave., W. Bletch; Norman ave., and Wabansia, Geiss; 75 West North ave., Harvey & Mose; 1060 Polk, Watson & Davidson; 11 Parmelee, Dornbos Bros.; 502 Park, Oliphant & Liddell; 3139 Parnell, Chas. Uher; Polk and Sholto, C. Kostlevy; 3408 South Park ave., Watson & Davidson; 828

Perry, C. Radeski; 402 N. Robey, Nelson; 567 Seminary ave., R. Griffith; Sixtieth and Stewart, L. Clark; 6811 Sangamon, F. Murphy; 6712 State, F. Murphy; Seventy-first and Oglesby, Feldkamp; Sacramento ave., Harvey & Mose; 535 Sacramento ave., Harvey & Mose; Thirty-first and Stewart ave., Wm. Bowden; Twenty-first near Rockwell, J. Watson; Twenty-third and Turner ave., C. Kostlevy; Thity-second near Lowe ave., C. Kostlevy; 206 Twenty-fourth Place, J. Hagedorn; 512 Union, W. Rustman; 3602 Vermont, Colter & Son; Woodlawn ave., near Forty-fifth, Dewar & Co.; Wallace and Thirty-fifth, Nash & Hanna; 647 Washburne ave., Baggot & Son; 6822 Wentworth ave. Lyon & Lee; 39-43 Washington, A. A. Campbell; 75 Wilson, W. Daniels; 1126 Wellington, Newberg & Rich, 6822 Wentworth ave., Lyon & Lee; Warren ave., near Albany ave., D. T. Jack; Willow near Fremont, H. Bauer; 1709 Yale, W. Bletsch.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: W. G. Borfield has completed plans for a 10-story apartment house, to be built at 333-334 Michigan avenue by E. W. Shirk. It will have elevators, and will be warmed by steam; cost, $150,000. Roeder, Coffin & Crocker have let the contracts for the construction of the Grant Locomotive Works, and work will be commenced in a few days. There will be eight buildings of brick and stone, and the entire cost of the plant is placed at $800,000. J. M. Van Osdel & Co. have in preparation the plans for a 15-story office building, to be built on Dearborn street, south of Jackson, by C. C. Heisen; will cost about $800,000. C. J. Warren has planned the reconstruction of the 6-story warehouse, 69x80, on Quincy street, east of Temple court, into an 8-story office building for Frank B. Bost; cost, $150,000. Julius Speyer has completed plans for a 5-story apartment house, 75x171, to be built on Michigan boulevard between Fourteenth and Fifteenth streets, by Edward White & Co. The building will be warmed by steam; cost, $100,000. The same architect has planned a 4-story factory for E. Cummings, to be erected at Forty-second street and Emerald avenue; cost, $20,000; also for George Hankins and others a grand stand, stables and other buildings for the West Side Driving Park, to be completed within three weeks, at a cost of $100,000; also for George Herbert, two 2-story flat buildings, to be built at Laflin and Polk streets; cost, $15,000; also for E. Parker, a dwelling at Fifty-seventh street and Indiana avenue; cost, $10,000. For John McNally, August Moritzen has planned a brewing plant for the Citizens' Brewing Co., to be built at Archer avenue and Main street; cost, $200,000. The same architect has planned a new stock and brew-house for M. Winter & Bros., at Pittsburg; cost, $150,000; also for Griesedieck Bros., at St. Louis, a new brewing plant, to be built at Eighteenth and Gratiot streets; cost, $300,000; also for M. Glick & Sons' Mississippi brewery at Minneapolis, Minn., a new brew and mash-house, to cost $75,000; for plans for John Walter & Co's. City brewery at Eau Claire Wis., a new malt-house and kiln; cost, $30,000; for Price & Wimmer, at St. Cloud, Minn., a stock-house; cost, $16,000. The new brewing plant of the Mobile Brewing Co., for which he has also prepared plans, is under way; cost, $180,000. Flanders & Zimmerman have planned a country residence for W. Foster, to be built at Glencoe; cost, $11,000; also eight or nine cottages, a dining-hall and stable for the Edgemere Club, to be built at Highland Park; cost, $20,000. W. L. B. Jenney and W. B. Mundie have planned a frame house, to be built at Highland Park; cost, $12,000. They have also designed a summer residence for F. S Hansen, to be built at Mackinac Island; cost, $10,000; also for W. H. De Camp, at Oak Park, a house; cost, $7,000; also for H. J. Peet they have planned two houses, to be built at Buena Park; cost, $10,000. R. C. Berlin has planned a 3-story and basement apartment house, 50x52, to be built on Webster avenue near Burling street, by S. Miller; cost, $12,000. He has also planned a 3-story flat building, 24x62, to be built at 88 Twenty-fifth street by Mrs. Jane Forrest; cost, $8,000. W. G. Borfield has planned a 4-story store and flat building, 25x65, to be built on Cottage Grove avenue near Thirty-first street, by Zemansky Bros.; cost, $12,000; also for Rev. J. L. Meyer he has planned a $3,500 residence, to be built at Oak Park; for Love & Ayer he has planned six 3-story dwellings, 100x65, to be built on Lake avenue; cost, $38,000. Bauer & Hill have prepared plans for the reconstruction of the Fisk National Bank building at Janesville, Wis. The floors will be lowered and a safety deposit department added; cost, $20,000. Edbrooke & Burnham have completed plans for a 2-story school building, to be built at Kenilworth by the Kenilworth Company. It will be constructed of pressed brick and stone; cost, $8,000. J. L. Silsbee has planned a 2-story residence for M. M. Jamieson, to be built on Newport avenue. C. A. Weary has planned a 4-story apartment building, 25x141, to be built at the northwest corner of Jackson and Paulina streets, by Thomas Parker, Jr.; cost, $30,000. For S. W. Roth he has planned four 3-story dwellings, 58x125, to be built at West Lake street and Columbia place; cost, $32,000. Also for Joseph Schoenthaler a 2-story flat building, to be built at Union Park place and Fulton street; cost, $3,200. Also for C. Crowley a 3-story and basement flat building, 25x60, to be built at Wilcox and California avenues; cost, $8,200. W. H. Drake has planned a 4-story carriage repository, 80x165, to be built on Wabash avenue south of Congress street, by F. G. Walker; brick and stone construction; cost, $40,000. Also for R. D. Sheppard, a 4-story apartment house, 125x89, to be built on Laflin near Adams street; brick and stone construction; cost, $80,000. Also for W. H. Fleming a 3-story flat building, 25x70, to be built at 3401 Indiana avenue; cost, $13,000. Also for Miss Howard a 4-story store and flat building, 40x90, to be built at 1518-1520 Wabash avenue; brick and stone construction; cost, $30,000. For George C. Hutchinson a 4-story store and flat building, 50x120, to be built at Milwaukee avenue and Curtis street; cost, $35,000. Also for H. F. Waite a 4-story store and flat building, 25x75, to be built at 2411 Wabash avenue; cost, $10,000. For M. S. Payne a $10,000 store and flat building, to be built at 2409 Wabash avenue; and for George C. Hutchinson a 3-story warehouse, 25x148, to be built at 194 Desplaines street. Frommann & Jebsen have planned a 4-story store and flat building, 50x120, for Edward Uihlein, to be built at Division and Robey streets; cost, $30,000.

HEATING AND LIGHTING.

New electric light plants or extensions of existing systems are reported from the following places: Amboy, Ill.; Milford, Del., address N. Pratt; Platteville, Wis.; Shushan, N. Y.; Great Falls, Mont., address W. J. Winters; Kinderhook, N. Y.; Lafayette, La.; Sharon, O.; Fond du Lac, Wis.; Georgetown, Ky., address J. W. Whittle; Gainesville, Ga.; South Boston, Va., address the Barbour Buggy Co.; Morganfield, Ky., address C. Waller; Gallatin, Tenn., address H. Holderman; Carrollton, Ga., address the Carrollton Light & Power Co., Oakville, Ont.; Sanger, Cal., address Henry W. Chase; Mt. Pleasant, Pa., address the Mt. Pleasant Electric Light and Power Co.; Davenport, Ia., address the Davenport Electric Railway Light and Power Co.; Fond du Lac, Wis.; Wheeling, W. Va.——Badger, Wis.: The plant of the Badger Illuminating Co., will be extended at a cost of $25,000. The following new companies have been incorporated: New Companies—Hastings (Mich.) Electric Light & Power Co.; capital stock, $15,000. Portland (Mich.) Electric Light & Power Co.; capital stock, $10,000. Chillicothe (Ill.) Water, Electric Light & Power Co.; capital stock, $30,000; incorporators, S. B. Hartz, G. H. Lucas, E. W. Wilson. Clinton (Ind.) Electric Light & Power Co.; capital stock, $10,000; directors, B. H. Morgan, W. H. Bonner, D. McBeth and others.

SEWERAGE NOTES.

Pittsfield, Mass.: An appropriation of $100,000 for sewers has been made. Bonds for $40,000 have been authorized.——Watertown, Mass.: The sewer committee has made its report recommending 11.9 miles of sewers, 300 feet to be of brick and the rest of pipe. The cost is estimated at $106,000.——Westborough, Mass.: The Selectmen have laid out a sewer system. Action will soon be taken.——Holyoke, Mass.: About 525 feet of the Front street sewer are to be rebuilt at a cost of $12,000.——Suspension Bridge, N. Y.: The estimate of $20,323 for the sewer extension proposed by the engineer, Mr. W. C. Johnson, has been accepted.——Orange, N. J.: Orange, Bloomfield and Montclair, are working for a joint sewerage system.——Bridgeton, N. J.; It is proposed to build a system of sewers at a cost of $60,000.——Williamsport,

Pa.: Mr. Reeder, the City Engineer, estimates the cost of a complete system of sewerage at $400,000. It is proposed to spend $200,000 at once, and $20,000 per year for 10 years.——Columbia N. C.: A stock company is to be organized to build pipe sewers. The City Engineer will lay out the system, and a franchise will be applied for.——Vicksburg, Miss.: The Lewis Mercer Construction Company, of New York, has applied for a franchise to build sewers. It has been suggested, however, that the city should advertise for proposals for construction. The cost of a complete system is estimated at $300,000.——Ironton, Ohio: Plans for a system of sewerage are being prepared by Mr. Rudolph Hering. ——Ft. Wayne, Ind.: Mr. Randall, City Engineer, has prepared plans for a sewer in the northwestern part of the city.——Elgin, Ill.: It is proposed to spend $11,500 on sewers.——Moscow, Idaho: Plans are wanted from engineers for a system of sewers. ——Middleborough, Mass.: Plans and specifications have been prepared by Percy M. Blake for the proposed sewers.——San Angelo, Tex.: The need of sewerage here will probably result in the adoption of a system at an early date.——Portland, Me.: The Main street sewer will be extended to the foot of Saco street. Other extensions are under consideration.—— West Bergen, N. J.: As soon as the assessment maps have been completed, the work of putting in sewers will commence at once.

WATER WORKS NOTES.

Concord, N. H.: The city government has voted $200,000 for water works improvements.——Lancaster, N. H.: Gravity works are projected.——West Boylston, Mass.: The Board of Trade is investigating the question of constructing works. J. C. Worcester is secretary.——Amenia, N. Y.: Works are again projected.—— Westport, N. Y. It is reported that works will be established.—— Tonawanda, N. Y.: The Village Trustees have passed resolutions complaining of the present supply furnished by the company and have appointed a committee to see what can be done to secure a better supply.——Wilkes Barre, Pa.: The People's Water Company has been incorporated; capital, $25,000.—— Rutherford, N. J.: At a special meeting the people voted in favor of a supply from artesian wells instead of from the Hackensack Water Company. The Election may be declared illegal, as it was called by the Mayor, and the Council claims that he has no authority for such action.——Huntsville Ala.: A new reservoir is projected.——Wheeling, W. Va.: It is reported that $12,000 works will be built to supply Altenheim.——Bridgeport, Ohio: The people have voted for the issuance of $25,000 of bonds for works, the supply to be bought from Martin's Ferry.——Zanesville, Ohio: About $25,000 will be expended for pipe and pipe laying, and the purchase of the pump is under consideration. The pipe will be brought directly, without asking for proposals.——Key West, Fla.: A proposition to build works is before the Council. Works have been projected from time to time for several years.—— Fowlerville, Mich.: The senate has authorized the construction of $40,000 works.——Milledgeville, Ga.: It is reported that a franchise has been granted to Samuel Walker, and that he wishes bids for a 4-inch duplex pump to force water through 1,700 feet of 4-inch pipe with a rise of 100 feet; also bids for 2,000 feet 4-inch-pipe and specials.——Atlanta, Ga.: The joint committee from the Water Commissioners and Council has voted not to accept the offer of the Chattahoochee Power & Water Company to furnish a supply of water and has passed a resolution in favor of carrying out the plan of Rudolph Hering for a supply from the Chattahoochee River. The next step is for the Council to ratify the action of the committee.——Milford, Mich.: Works are talked of, outside parties have been investigating the matter.——Port Huron, Mich.: A 6-foot tunnel beneath the Black River for water and gas mains is projected.——Plymouth, Mich.: The Council has called a special village meeting to consider the bonding of the village for $20,000 for works.——Pontiac, Ill.: The people voted to build works at their last election, and several propositions to do the work have been received.——Winnipeg, Manitoba: Improvements are to be made by the company, including new mains.—— Pasadena, Cal.: The Pasadena Highland Water Co. have been incorporated; capital, $15,300.——Aberdeen, Wash.: Bids for $65,000 of water bonds are wanted until June 10. J. H. White is city clerk.——Colfax, Wash.: A committee from the Council is investigating proposed works. A supply from springs by gravity is talked of.——Northfield, Minn.: Surveys and estimates for works will be made by W. W. Curtis, St. Paul.——Sheridan, Ill.: A plan for works is advocated by John Armstrong.——Tracey, Minn.: The people have voted in favor of works.

BIDS AND CONTRACTS.

Vicksburg, Miss.: Proposals are invited for sewer construction. Address R. V. Booth, mayor, before July 6.——Maywood, Ill.: Bids are wanted until June 24 for sewer construction. Plans and specifications are with C. W. Maynard, 84 La Salle street, Chicago. ——Ft. Brady, Mich.: Proposals are open until June 23 for the erection of certain buildings. Address Capt. G. S. Hoyt, U. S Quartermaster's office, Sault Ste Marie, Michigan.——Manchester, Mass.: Bids are wanted for laying 12 miles of cast iron pipe. Address S. Knight, Board of Water Commissioners.——Wayne, Neb.: Bids for the construction of water-works are open until June 24. Address A. A. Richardson, Lincoln, Neb.——Norfolk, Va.: Bids are open until July 27 for the erection of a county court house and jail. Address I. H. Harn, Clerk of Board of Supervisors. ——Lu Verne, Minn.: Sealed proposals will be received until June 20 for the labor and materials required in supplying a complete system of water-works.——Savannah, Ga.: Sealed proposals will be received by the City of Savannah, Georgia, eleven (11) o'clock A. M., July 15, 1891, for furnishing and contracting two (2) high-duty pumping engines, each having a capacity of ten million (10,000,000) U. S. gallons per day, and the necessary boilers and other appurtenances pertaining to a pumping plant. All to be in accordance with general specifications on file in the Water Office at Savannah, Ga., or which, with all other information, can be obtained from Thomas T. Johnson, Consulting Engineer, at room No. 29, No. 171 La Salle street, Chicago, Ill.——Niles, Ohio: Until June 30 sealed proposals will be received for the construction of a complete system of water works, or for any department of work, or material separately.

THE MASTER PLUMBERS.

If you are going to attend the meeting of the Master Plumbers in Cincinnati in June don't forget the Old Reliable and justly popular Big Four Route, running the finest trains and being the only line from Chicago that lands passengers in the Grand Central Station, Cincinnati. Reduced rates will be made for the meeting. Address for rates, etc., J. C. Tucker, General Northern Agent, 234 Clark street, Chicago.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

In addition to this the Wisconsin Central and Northern Pacific Lines run Pullman Vestibuled and Tourist Sleepers *without change* between Chicago and Tocoma, Wash., and Portland, Ore., on train leaving Chicago via the Wisconsin Central daily at 10:45 p. m., and St. Paul via the Northern Pacific at 4:15 p. m.

For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205

Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

SUNDAY IN THE COUNTRY.

Commencing Sunday May 24th, and regularly each Sunday thereafter during the summer season, the Wisconsin Central will run a Sunday Excursion train between Chicago and Waukesha, making stops at all intermediate stations, leaving Chicago at 8:30 A. M., and returning, arriving in Chicago at 8:30 P. M. Commencing Monday the 25th, and regularly each Monday thereafter during the summer season, a train to be known as the "Business Man's Special" will be placed in service from Waukesha to Chicago, leaving Waukesha at 5:30 A. M., and arriving in Chicago at 9:00 A. M. These trains, with the regular service on Saturdays leaving at 3:00 P. M., 4:25 P. M., and 5:00 P. M., make it possible to spend the day in the charming lake region in Northern Illinois, reached by the Wisconsin Central, and return in time for business Monday morning.

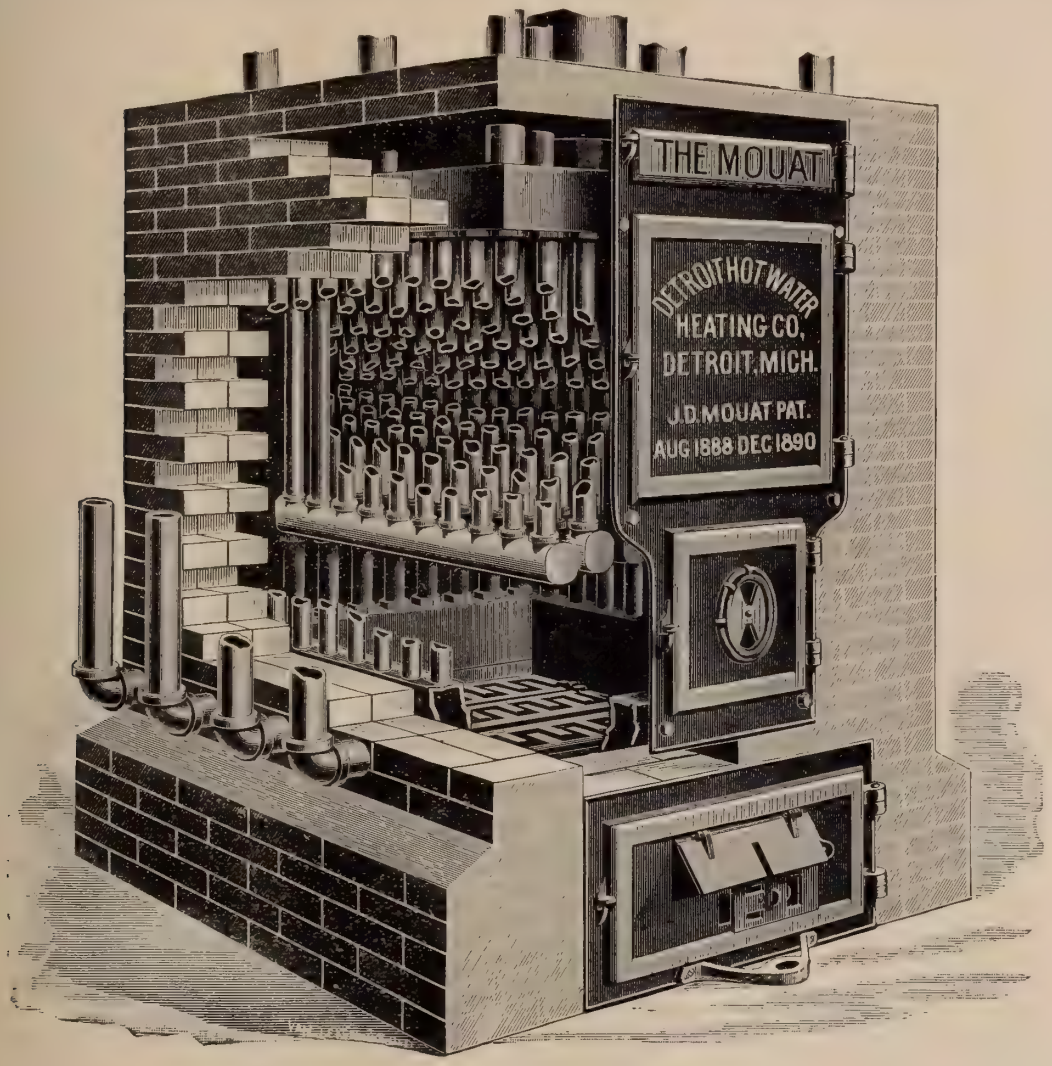
For detailed information as to intermediate time, excursion rates, etc., apply to Geo. K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or F. J. Eddy, Depot Ticket Agent, Harrison street and Fifth avenue, Chicago, Ill.

MOUAT HOT WATER HEATER.

Why the Mouat Hot Water Heater is superior to all others for warming dwellings, green-houses and schools:

First—It has the advantage over drop tube heaters for the following reasons: The water passing directly from base to top over the intense heat of the fire, the hot water going up does not come in contact with the cold water going down which must chill it, but keeps all of its heat until it reaches the radiators.

Second—Every particle of water and sediment can be withdrawn from the heater by opening the draw off cock in the base, thus avoiding freezing if building is vacated in cold weather, also cleans the entire apparatus of any obstruction at the time when necessary, a result that cannot be accomplished in a drop tube heater.



The drop tubes if clogged by sediment are liable to burn out. This annoyance is completely overcome in our heater.

Fourth—It advantage over horizontal pipe or sectional heaters is, that it has much more fire surface compared to grate surface, making it more economical.

Fifth—It has no flat surface over the fire to accumulate dust.

Sixth—Every pipe in the heater receives the same amount of heat while with the sectional heater the section nearest the fire receives most of the heat and the one near the top but very little.

Seventh—The resistance of friction in the horizontal heater has to be overcome, while with the Mouat the circulation is unimpeded, being direct through vertical pipes from base to top.

James B. Clow & Son,
Lake and Franklin, Chicago,
Sole Western Agents.

W. C. VOSBURGH MFG. CO. [LIMITED.]

DESIGNERS AND MAKERS OF

GAS AND ELECTRIC FIXTURES

TRADE OF THE WEST AND NORTHWEST SUPPLIED AT FACTORY PRICES.

We are licensed to manufacture Electric and Combination (Gas and Electric) Fixtures and parts of same.

Western Branch, 184-186 Wabash Avenue, Chicago.

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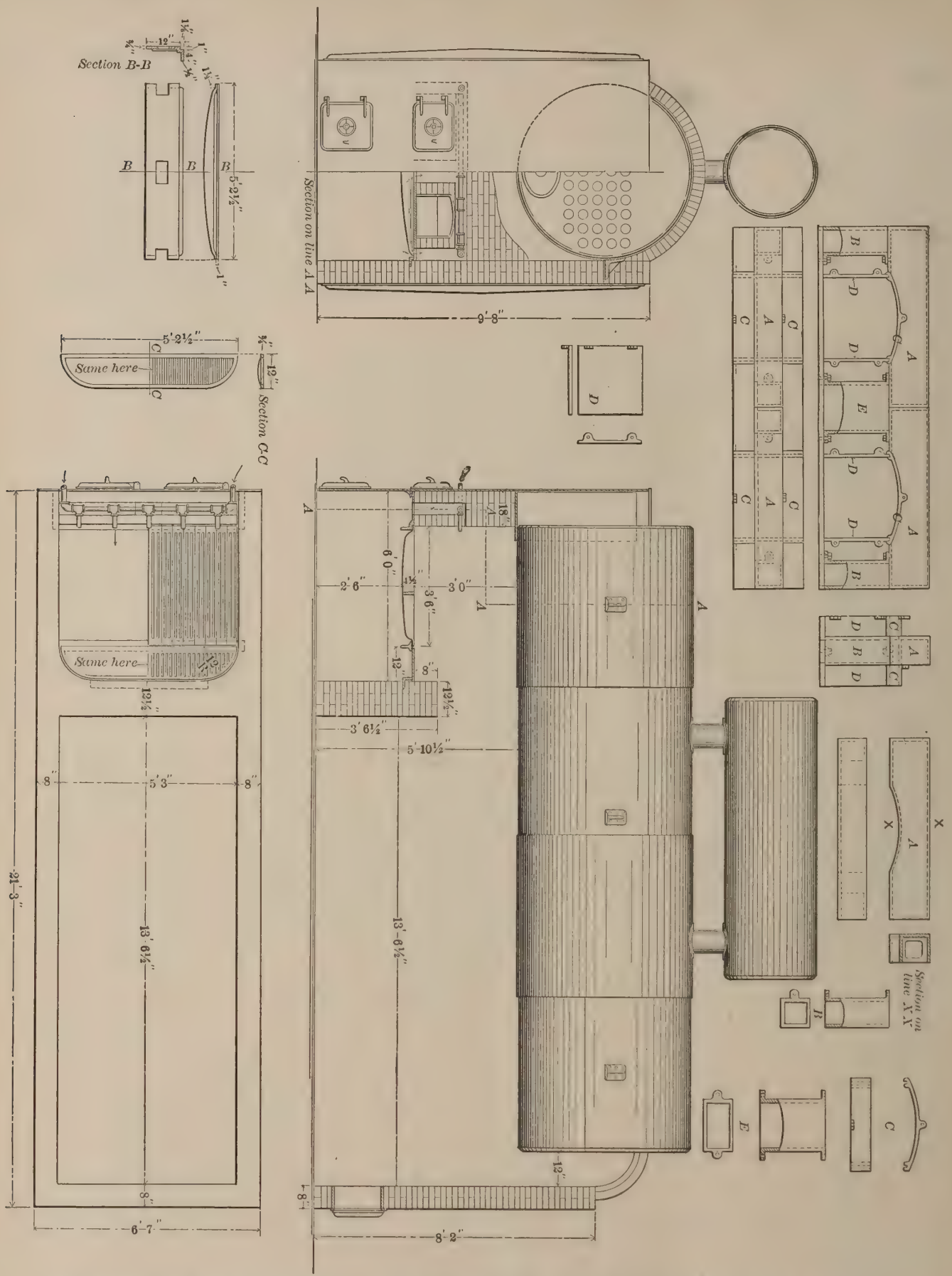

HUTCHINSON'S WATER GAS FURNACES.

The above cut is a detailed drawing of the Hutchinson Water Gas Furnace applied to stationary boilers. This is the only practical method of abating smoke nuisance on all constructions of furnaces. The system is just as applicable to locomotive or tug boilers as the stationary or returned flue boiler. The principal consists of converting a furnace into a Water Gas Furnace by supplying Oxygen and Hydrogen and taking up the Carbon as it is generated from the burning fuel. There are over 5,000 of these furnaces in successful operation, which is sufficient proof that it is no hardship to abate the smoke nuisance but on the contrary is a matter of economy to consume the gas under the boilers which usually passes of in the form of smoke and soot. Steam users generally speaking are scattering about 25 per cent. of fuel over themselves and neighbors. By the use of this device there is no fuel wasted, and all the gas is consumed immediately under the boilers leaving no soot or settlement to lodge in the flues or stick to the bottom of the boiler covering the surface of the iron with a non-conducting substance of greater density than asbestos. For further particulars address,

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The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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IN the preparation of the history of the National Association of Master Plumbers we have been greatly aided by President Robert Griffith, and we wish thus publicly to acknowledge the many kind favors and courteous treatment at his hands.

THE National Association has fulfilled every promise made and discharged every obligation which it took upon itself. It has proved faithful to its trust and loyal to the principles on which it was founded. In all its purposes and in the fulfillment of its mission it has served the public good in every instance. Has not the period now arrived when it would be proper to give some attention to the improvement of the condition of the individual members?

THE coming convention would be a good place and time for the plumbers to resolve that each member be appointed a committee to take steps to maintain equitable prices for plumbing work. Other professions carefully guard the matter of fees and prices, and surely none is more worthy of his hire than the plumber.

THE HOSPITAL is responsible for the following case of plumbing inspection by a cat: A gentleman, suspecting the drainage of his house to be imperfect, fell upon a happy idea of having the plumbing inspected. He threw the entire establishment open to the inspection of his cat, and then poured a strong infusion of valerian into the pipes. The plot succeeded to a marvel. Puss, who is as fond of perfumes as any client of Mr. Rimmel's, soon discovered three leaks, at each of which she established herself in turn to enjoy the pungent odor at her leisure. Thus not only were the householder's suspicions confirmed, but the actual situation of the leaks were revealed as accurately as if they had been indicated by a sanitary inspector. We do not vouch for the truthfulness of this story, although we are ready to believe it; but one thing is certain, and that is, we would place more confidence in a cat's inspection than in that of men who know nothing about plumbing. We hope, however, the above will not set an example to householders whose plumbing needs inspection. Good plumbers are the best inspectors that can be found, and when the plumbing is suspected let the cat dose away in the front door and hasten to get a plumber to set the drains in proper order.

THE sentiment favoring plumbers for plumbing inspectors is rapidly growing, and there is scarcely a city in the country to-day in which the matter is not receiving serious consideration. The near future will witness the triumph of this principle in sanitation, and the credit is due to the intelligent and constant efforts of the master plumbers.

OUR late departed Legislature did not cover itself all over with glory in refusing to pass the three-mill tax bill which provided the necessary means for placing Chicago in a respectable, cleanly and sanitary condition for the World's Fair. We are confronted with the stubborn fact that the city is not in that state of cleanliness and health that it should be, and that there is no money to be expended for this purpose. But the cunning hand of the small-fry politician in his inglorious quest for cheap fame had to be shown regardless of the necessities of a great city soon to be visited by the foremost representatives of the nations. But Chicago will be presentable. The money will be raised, and the great throng of visitors properly cared for.

IN this issue of THE SANITARY NEWS will be found a brief history of the National Association of Master Plumbers from its origin to the present time. The history is necessarily much abridged and imperfect, but it demonstrates what can be done when men unite on a great principle and labor in a cause so justifiable as this. The truths of the history have been followed to their logical results and their philosophy interpreted. We give this publication as the means of bringing the great work of the master plumbers to public notice, that it may be known for what they labored and what they have accomplished for the public good that could have been accomplished in no other way. Public approbation and admiration cannot be withheld when these truths are known.

DIGNITY OF THE PLUMBING PROFESSION.

Plumbing is no longer a mere trade. Its importance and value in relation to health and its requirements regarding scientific knowledge have elevated it to a profession. It is clothed with the responsibilities of the learned professions and the dignity of the sciences. The high qualities of mechanical skill are combined with the knowledge of the best sciences of the most practical utility. It unites skilled labor and high educational qualifications in one. This being the nature of plumbing to-day, it becomes the duty of the plumber to maintain in every way the dignity of his high calling. It should be his special care to have the profession as free as possible from the deleterious effects of the incompetent and unscrupulous. He cannot afford to have the high position to which plumbing has attained tainted by the ill influences of the unworthy and unqualified. The results of his labors in every instance should be added evidence of his skill and capacity in meeting the demands of the highest and latest approved requirements of sanitary science. He has a responsibility that rests upon none other. To a great extent the healthfulness of our homes and the vigor of our country depend on the character of his work. This responsibility gives to the plumbing profession a dignity and importance that attach to few others, and places upon the plumber the duty of qualifying himself to maintain under all circumstances and conditions the dignity which public sentiment has placed upon him and which his position among the learned professions demand.

The day of the tinker and scrimper is happily past. Out of the labors and influences of the National Association of Master Plumbers has come a new era. The relations of trade interests, legislative councils, boards of health, sanitary officials and the public generally have changed with respect to plumbing, and the plumber, always in the advance in these great interests, was ready to meet the higher obligations and demands of his profession. Through the efforts of plumbers the fraternity is being freed from the bad effects of the incompetent, and have to a great extent surrounded themselves with a penal code, rendering work performed not up to the established standard an act punishable by fine. They have at all times taken the lead in matters which have resulted in material good to the public in the promotion of public health. To maintain the dignity of their calling as it should be maintained, the dignity of each individual member of the profession must be likewise maintained. This places a personal responsibility upon each which extends to business interests and practices. Unfair rivalry and unreasonable competition are not the elements that should enter into the profession as a means of providing the strength and harmony on which its progress and prosperity depend. The dignity of the profession rests to a great extent on business practices which should demand recompense commensurate with its importance and responsibility. Competition that would reduce prices below this will detract from the standing of plumbing and tend to lessen its importance in the esteem of the public. This is a matter the profession can control. It is wholly within its own direction and should receive consideration and careful attention. It is the one thing of importance now before the master plumbers of this country. Proper action taken in this regard will be an act of justice to the plumbers themselves, and will maintain the dignity of the profession in a manner that nothing else can.

PLUMBERS AND THE WORLD'S FAIR.

The question of a sanitary exhibit at the Columbian Exposition, to be held in Chicago in 1893, is an important one, and one that should receive the attention of master plumbers. Without their aid no exhibit could be made worthy the name. An exhibit of sanitary appliances from which the plumber is excluded, or in which he does not take an active part, would be indeed small and uninteresting. The management of the Exposition surely realize the importance of this feature, and are also aware of the fact that its completeness and success lie with the plumbers of this country. There might be some kind of an exhibit made without the aid of the plumbers, but we are at a loss to know of what it would consist. While the subject of sanitation is broad, covering every phase and condition of life, its greatest importance centers in the home, and no home can be made to fill the requirements of sanitation where the plumbing does not receive its full share of consideration. It is of first importance, and an exhibit to be of interest and value must give place not only to materials used but the workmanship and scientific principles employed in plumbing work. If there were nothing displayed but the appliances that sanitary plumbing has brought into existence, an exhibition would be presented which would surprise the visitors and afford instruction of great value. An interesting feature would be the construction of a representative American home with perfect plumbing and drainage, ventilation and heating, architectural appointments, etc. The different materials and fixtures used could represent the different manufacturers and display the latest inventions and devices in actual operation exposed to full view. This building could be so arranged as to provide rooms for manufacturers' supplies and the exhibition of specialties and for headquarters of this department.

Whatever arrangements made or course pursued in this direction by the management, one thing is certain: The aid and support of the plumbing fraternity should be solicited and secured, and so largely do their interests enter into an exhibit of this kind that giving them the supervision of the display would be the wisest course to pursue. It would insure its success at once and draw unto it the aid of every section of the country. We have no doubt the management recognizes this and fully appreciates it. The influence that would thus be brought to its support would be immediate and extensive. The associations of master plumbers would be as already organized committees with this special interest in view. The work would be commenced at once throughout the country, and support and aid could thus be obtained that could be reached in no other way. The organization is now complete, and the delay of perfecting new committees and arrangements would be avoided. In the hands of the plumbers the exhibit would be a success, and the attention of the management is respectfully called to the suggestions offered.

NATIONAL ASSOCIATION OF MASTER PLUMBERS.

A BRIEF HISTORY OF THE ASSOCIATION FROM ITS ORGANIZATION TO THE PRESENT TIME.

PRELIMINARY EFFORTS.

In the latter part of 1882 the Master Plumbers' Association of New York, viewing the injury the trade suffered by the purchase from manufacturers and dealers in plumbing goods, by the outside public at and below trade prices, became convinced that some united action was necessary to secure to plumbers justice at the hands of the dealers. Accordingly a full attendance of the association was held December 1, which was resolved into a committee of the whole with "Protection to the Trade" as the subject for consideration. The result was a committee of ten appointed to devise such means as would best serve the ends in view. This committee not having discretionary power to act efficiently, was at a subsequent meeting discharged, and a new committee, enlarged to twenty-five members, was selected with Mr. T. J. Byrne as chairman, and was given powers to perform the duties entrusted to it. The committee met January 10, in New York city, organized, elected officers, appointed sub-committees, and invited the Brooklyn Association to join them. It was then fully realized that to secure success it was necessary to obtain the co-operation of the master plumbers throughout the country, and a circular was prepared by the joint committees of New York and Brooklyn, and sent broadcast throughout the United States. The circular was dated January 25, 1883, and set forth the necessity of united action to secure adequate protection, and called for the views of the trade regarding steps to be taken to secure the object in view.

The responses to this circular were so encouraging as to warrant the committee to pursue active measures for the formation of Master Plumbers' Associations in the cities of the country with a view of holding a national convention of the craft, and the formation of a national association. To further this end a sub-committee on organization was formed, and on February 26, issued another circular addressed to the master plumbers of the United States, calling attention to the need of local organization and the possible good results of a convention. The interest manifested was so great, and there being sufficient evidence that a convention was desired for the formation of a national association, it was decided by the Committee on Protection held March 7, that the Sub-Committee on Organization and Convention issue

a circular fixing a date for holding the convention, and inviting the co-operation of the trade. This circular was issued March 27, and was a call for a general convention to be held on or about June 20, 1883, in New York City. On April 3, another circular was issued containing suggestions for the formation of local associations and the selection of delegates. On May 9, a circular was issued giving the basis of representation for delegates and fixing the date of the convention on June 27. The final circular was issued June 5, and was in the nature of congratulations and a guide to delegates to the convention who were to assemble June 27, 1883.

THE FIRST CONVENTION.

Pursuant to call the convention assembled at Masonic Temple, New York, Wednesday June 27, and was called to order at 10:30 A. M. by Mr. Edward Murphy, of New York. Abraham Mead was unanimously chosen temporary chairman, and Enoch Remick and Edward Murphy were chosen temporary secretaries. The Committee on Credentials reported 125 delegates present representing New York, Brooklyn, Chicago, Norfolk, Philadelphia, New Haven, Baltimore, Hudson County, N. J., Cleveland, Cincinnati, South Norwalk, Conn., Newark, Providence, Poughkeepsie, St. Louis, Washington, Boston, St. Paul, Detroit, Syracuse, and Johnstown, Pa.

The convention was then organized with the following permanent officers: Chairman, Major W. E. Foster; Vice-Presidents, Abraham Mead, G. W. Coger, W. H. Graham, S. S. Shedd, Andrew Young, D. B. Foster, E. Dunn, H. McCallum, J. H. Chambers, Thomas Phillips, J. J. Dunnigan, Robert Morgan, T. P. Tuite; Recording Secretaries, E. Remick and Edward Murphy; Corresponding Secretaries, M. J. Lyons and James Millar, Jr.; Financial Secretary, H. W. Tombs; Treasurer, Albert Ivers; Sergeant-at-arms, James Smith. Isaac Riley was substituted for Mr. Coger as Vice-President. The usual business attending such conventions followed, and a very deep interest was manifested throughout.

There were two questions in the minds of the delegates and before the convention: One was that of trade protection, and the other that of the formation of a National Association. The question was whether the convention was called to formulate some measures for protection or for the purpose of organizing a national association? Both objects were in view and both were the outgrowth of this convention. Many able speeches were made on these issues, and the determined spirit of the convention was manifest.

The Committee on Organization reported a preamble, setting forth the objects of the association and the name, and a constitution defining the scope of the organization and setting forth the duties of the officers, which was adopted, committees were appointed and the work of the convention directed toward the organization of a National Association, and the

NATIONAL ASSOCIATION OF MASTER PLUMBERS

was duly organized June 28, 1883, with the following officers:

President Col. Geo. D. Scott; First Vice-President, Andrew Young; Recording Secretary, Edward Murphy; Financial Secretary, Enoch Remick; Treasurer, Mortimer J. Lyons. Executive Committee, J. W. Birkett, George Cummings, T. J. Byrne, J. F. Blackshaw, E. Dunn. State Vice-Presidents, J. W. Birkett, J. H. Garretson, H. J. Burke, James Tucker, Thomas Philips, D. B. Foster, James Smith, W. H. Graham, J. J. Dunnigan, S. S. Shedd, T. P. Tuite, W. E. Foster, Robert Morgan.

On Friday morning, June 29, at 10 o'clock, the first meeting of the National Association of Master Plumbers was called to order by President Scott. The business of the convention was continued, the reports of committees received and the necessary committees appointed for continuing the work through the coming year. It is interesting to note that this early originated the Sanitary Committee and the Committee on Essays, both of which have had a great influence in bringing the National Association in touch with the highest public interest and welfare. Among the subjects selected for essays at this convention were the following: "General Observations on Trade," "Proper Education for the Plumber," "The Relation of Masters to Apprentices," "Ancient and Modern Plumbing," "National Association," "Apprenticeship," "Architects in their Relation to Plumbers," "Water and the Water Supply," "The Unification of the Craft," "The Sanitation of Cities," "National Legislation," "The Relation of Householders to Plumbers," "Our Relation to Wholesale Dealers." This range of subjects presents the different interests to which the plumbers of that day were devoted, and shows clearly that no selfish motive actuated the formation of the association. On the other hand it is plainly seen that a liberal public spirit pervaded the assembly and linked it with humanity's greatest wellbeing. It also shows that the advancement of learning and skill in the trade was one of the important objects in view. It is also interesting to note that on this broad and liberal basis the association has ever since been conducted, and to-day it is attached to these interests which concern most deeply man's highest earthly estate.

Several cities were placed in nomination for the next convention but the choice fell upon Baltimore and the time fixed was on or about the 20th of June following. With some instructions to the Committee on Constitution and By-Laws and other committees, the convention adjourned.

JUNE, 1883—JUNE, 1884.

On the adjournment of the first annual convention, the National Association of Master Plumbers started out on its first year of existence. It has been seen what duties lay before the association, its officers and committees and with what resolution these duties were to be discharged. Trade protection was to be secured, local organization to be extended, further adjustment and completion of the National Association, and some uniformity of action devised regarding the important questions to be dealt with by this association. This year was the setting in motion of a new machine and the adjustment of its parts in harmony with one another and in consonance with the propelling force. The convention left little doubt as to the perfection of the machinery and the harmony of its parts in action. The fundamental law of the association had not been completed, and a committee was now at work framing a constitution and by-laws. The Executive Committee had entered upon the discharge of new duties, and all the officers and members found themselves in a new field of action. But the work was not foreign to their vocation, and the enthusiasm, energy and wisdom with which this work was prosecuted cannot but win the admiration and applause of all.

The Executive Committee met for organization July 24, 1884, at New York. The committee classified its duties as follows: 1. The furtherance and establishment of legitimate bases of trade protection, as between the plumber, the manufacturer, dealer and the consumer. 2. The increase and encouragement of associations of Master Plumbers in every place practicable throughout the United States. 3. The maintenance of the authority and integrity of the National Association, in order to enable it to fulfill its appointed work in a complete and satisfactory manner. In regard to protection the committee commenced work in New York, but local associations affected arrangements with dealers in the cities of St. Louis, Brooklyn, Washington, Pittsburg, Baltimore, Philadelphia and others. Enough was done to demonstrate the possibility of final success. Local associations received a share of the attention of this committee, although this was left more particularly with the state vice-presidents. Associations in the following cities were organized and affiliated with the national association: Boston, Brooklyn, Buffalo, Baltimore, Camden, N. J., Cincinnati, Chicago, Cleveland, Columbus, Detroit, Des Moines, Hudson County, N. J., Indianapolis, Kansas City, Louisville, Milwaukee, Minneapolis, Montgomery, Mobile, New Ark, New Haven, New York, Norfolk, Nashville, Oakland, Philadelphia, Poughkeepsie, Pittsburg, Providence, Portland, Rochester, South Norwalk, St. Louis, St. Paul, San Francisco, Syracuse, Wilmington, Worcester, Washington. Thus will be seen the work done by the Executive Committee and the state vice-presidents in extending local associations and the influence of the National Association. At the same time the interests of the National Association were being extended, circulars, letters and reports were sent throughout the states, and the spirit of the association was felt all over the country. Committee meetings were held, conferences had with dealers and by the aid of the Second National Convention a wonderful progress had been made, and the National Association with its objects and purposes was an established success.

THE SECOND ANNUAL CONVENTION.

The second annual convention assembled in the Corinthian Hall, Masonic Temple, Baltimore, June 26, 1884, and was called to

order at 10 o'clock A. M. by the President Col. Geo. D. Scott. The committee on credentials reported representatives present from Baltimore, Brooklyn, Boston, Chicago, Cincinnati, Cleveland, Columbus, Canton, Des Moines, Detroit, Dayton, Harrisburg, Hudson County, N. J., Indianapolis, Kansas City, Louisville, Norfolk, New Haven, New York, Philadelphia, Pittsburg, Providence, St. Louis, St. Paul, Washington, Wheeling, Wilmington. There were 146 delegates present.

COL. GEO. D. SCOTT, FIRST PRESIDENT, N. A. M. P.

The committee on Constitution and By-Laws reported, handing in a constitution, by-laws, and rules of order. These were read section by section, amended and adopted by the convention.

On the Thursday morning sessions essays were read as follows: "Proper Education and the Plumber," Boston; "The Relation of Masters to Apprentices," Providence; "National Association," Philadelphia; "Architects in their Relations to the Plumber," Cincinnati; "The Purity of Metals as Pertaining to Public Health," Hudson County, N. J.; "The Unification of the Craft," Baltimore; "Sanitation of Cities," Chicago; National Legislation and How it May be Obtained," Washington; "The Relation of the Wholesale Dealers to the Plumber," Brooklyn; "The Relation of the Householder to the Plumber," St. Louis.

THE BALTIMORE RESOLUTIONS.

On Thursday afternoon, the second day of the Second Annual Convention, the broad and rugged bases of trade protection were laid, and the banner unfurled beneath which the advancing phalanx of the master plumbers marched to victory. These consisted of the Baltimore resolutions introduced in an address by Mr. J. J. Wade, of the Chicago Association, and which are as follows:

WHEREAS, The manufacturing and wholesale firms in plumbing material persist in selling to consumers, to our injury and detriment, placing us towards our customers in the light of extortionists, causing endless trouble; and,

WHEREAS, The system of protecting us from this wrong, which draws in its wake other wrongs, is ineffective, it is absolutely necessary to perfect such a system, by united action, which will remove these evils from which we have suffered for years; therefore, be it

Resolved, That we withdraw our patronage from any firm manufacturing or dealing in plumbers' material selling to others than Master Plumbers.

Resolved, That the manufacturers of gas fixtures selling to consumers shall not receive the patronage of any Master Plumber.

Resolved, That the Master Plumbers shall demand of the manufacturers and wholesale dealers in plumbing materials to sell goods to none but Master Plumbers.

Resolved, That this Association shall keep a record of all journeymen and plumbers who place in buildings plumbing material bought by consumers of manufacturers or dealers.

Resolved, That any manufacturing or wholesale dealers, dealing in wrought iron pipe, who sell to consumers shall not receive our patronage.

Resolved, That a committee be appointed by this Association in every state and county, for the purpose of reporting to the proper officer at its head in the state any violation of these resolutions.

Resolved, That these measures are just and necessary to our welfare, and a rigid enforcement is demanded.

Resolved, That this convention endorse the above, and urge upon the National Association to perfect and adopt a uniform system of protection for the trade over their entire jurisdiction.

A knowledge of two things is all important when the decisive blow in the leadership of a great reform or revolution is to be struck: The one is how to strike, and the other, no less important, is when to strike. This blow, aimed at an oppressive evil, was opportune both as to the manner and the time in which it was delivered. Future history fully demonstrates the wisdom of this courageous step which marks an era in the history of the association, and carried the measures of reform into a just and justifiable triumphant revolution.

The financial secretary reported receipts to the amount of $1,340.12, being 50 per cent of the assessment. The treasurer's report showed disbursements of $964.11, and receipts of $1,340.12. The reports of the state vice-presidents were received and placed on file. The following officers were elected for the ensuing year:

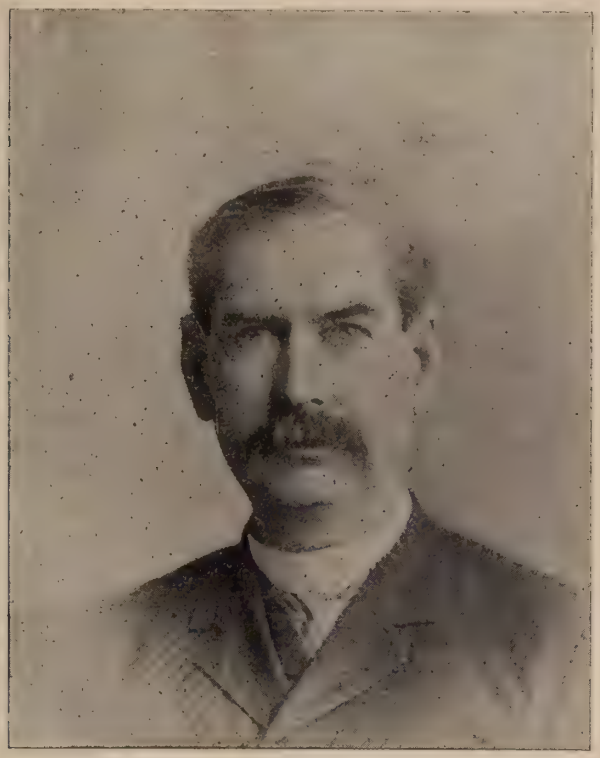
President, Andrew Young; First Vice-President, James Allison; Recording Secretary, J. J. Wade; Corresponding Secretary, J. J. Hamblin; Financial Secretary, Enoch Remick; Sergeant-at Arms, D. H. Collins. Executive Committee, Andrew Young, J. J. Wade, James Allison, W. H. Graham, Jeremiah Sheehan, John Sanders, Martin Moylan, Alex. W. Murray, Thomas Harvey. State Vice-Presidents, J. Shepard, California; Robert Morgan, Connecticut; Allen Speakman, Delaware; E. J. Hannan, D. C.; T. C. Boyd, Illinois; J. S. Farrell, Indiana; J. E. Allen, Iowa; J. C. Strauss, Kentucky; J. H. Bond, Maine; J. A. Wilson, Maryland; Isaac Riley, Massachusetts; J. D. Mouat, Michigan; W. J. Freaney, Minnesota; J. L. Ryle, Missouri; J. H. Kniffen, New Jersey; J. A. Macdonald, New York; Wm. Halley, Ohio; A. M. Hicks, Pennsylvania; Thomas Philips, Rhode Island; Wm. Hare, West Virginia; W. E. Goodman, Wisconsin; W. B. Davis, Virginia. St. Louis was selected as the next place for the convention; a resolution was adopted demanding recognition of practical plumbers as members of boards of health, and the convention adjourned.

It will be interesting to note the central points around which this association was organized. It must be remembered that protection to the trade was not then a settled fact as it is to-day. The great battle had not been fought, and the plumbers had no advantage over the consumer in the purchase of his material. They were left practically as workmen employed to do plumbing work. Their supplies were being sold by the dealers to consumers at the prices the plumbers had to pay, and in this regard there was no line drawn between the plumber and the consumer. The injustice of this was so apparent and so oppressive that protection became a popular and justifiable movement on the part of the association. Out of this chaotic and demoralized state of trade it was sought to bring harmony, justice, and business equity. Another object is that of the advancement of plumbing. It was recognized that plumbing was not only mechanical skill, but a science relating to public health so closely that its best possible attainments should be secured. The public health was endangered by the indiscriminate sale of plumbing material and the employment of incompetent workmen which resulted from such sales. A relief from these evils was the object sought. Another object was the health of cities and communities in a manner in which none but plumbers could operate, as none others were qualified for the work. Water supply, apprenticeship, the advancement of learning, the highest qualification of plumbers, were objects that received the special attention of the association. With these great objects in view, founded on these important, just and equitable principles, it is no wonder that the association thrived.

JUNE 1884—JUNE 1885.

While a great amount of work was done the preceding year, much of it was necessarily preliminary to its completion in future years. The Baltimore resolutions had been adopted at the second annual convention, and to put them into practical operation was one of the tasks for the second year of the association. It must be understood that there was much opposition and prejudice in which malice and willful deceit and false representation entered regarding the resolutions and protection, and to secure compliance with them was not the work of a day. A meeting of the

Executive Committee was called July 21, at Chicago, at which a policy was outlined to be pursued during the ensuing year. At this meeting President Young was authorized to use such measures as he deemed prudent in presenting the Baltimore Resolutions to the manufacturers. Mr. Young, recognizing New York as headquarters of the manufacturing interests, proceeded in person to that city and presented the resolutions to a meeting of the manufacturers which was called for the purpose. Time was asked for reply, and the meeting adjourned for one week. The reply was a declination to accept the resolutions. Then commenced a struggle worthy of record in a more pretentious history than this. Circulars were sent out by the manufacturers to architects and the press for aid, and President Young was called a communist with an insane idea. But in the bursting storm the master plumbers stood firm sheltered by their sense of justice and consciousness of right as with a shield. The leading spirits of the revolution pressed on with opposition even in their own ranks, and future history will record the wisdom of their course, the inspiration of their courage, the justness of their convictions, and the triumph of a principle.



ANDREW YOUNG, SECOND PRESIDENT N. A. M. P.

The second meeting of the Executive Committee was held in Chicago, September 10, at which routine business was transacted, auditing and paying bills, etc. As a meeting of the National Health Association was to be held this year in St. Louis in October, it was decided to hold a meeting of the committee at that place October 16. At this meeting conferences were held with members of the National Health Association, and the committee received an invitation to become members of that association, which shows the recognition that was extended to the trade. President Young laid before the committee a vast amount of correspondence from manufacturers, dealers, plumbers and others throughout the country, and the committee unanimously resolved to endorse the action of Mr. Young in his course taken against firms who had issued certain documents to the public. The secretary reported that he had sent copies of the Baltimore Resolutions to the manufacturers and dealers throughout the country for their signature, and that the replies were almost universally prompt and favorable. At this meeting it was deemed advisable that a draft of a bill providing for the licensing of plumbers by State legislation should be prepared by the coming convention and presented to the various State Legislatures at their next meeting. N. K. Ludlow was appointed State Vice-president for Alabama, and James Foley for Kansas. The fourth meeting of the committee was held in New York, February 24, at which much information was gathered relating to the state of the trade which was presented to the Third Annual Convention. The fifth meeting was held at St. Louis, June 22, and made certain recommendations to the convention then about to convene.

As some indication of the work done this year the following amount of stationery, mail matter, documents etc., used will be of interest: These are 1,000 envelopes for President Young, 1,000 envelopes for Recording Secretary, 1,000 envelopes for Financial Secretary, 14,000 envelopes used in sending out documents, etc., to individual plumbers, 300 Baltimore Resolutions sent to manufacturers, etc., 1,000 wrappers used in sending out matter in bulk to officers, State Vice-presidents, etc., 1,000 reports of assessments to Financial Secretary, 2,000 constitutions, by-laws and officers of National Association of Master Plumbers, 1,000 arguments and Baltimore Resolutions as an address sent out by the Executive Committee, 15,000 notices of assessments to Financial Secretary, 2,000 circulars to vice-presidents of states and presidents of local associations, 2,000 letters sent out by President Young, 10,000 addresses to master plumbers, 300 pamphlets sent to manufacturers asking for signaturers to the Baltimore Resolutions, 2,000 notices of organization, 2,000 pamphlets "How to Organize Plumbing Societies," 6,000 reports of meetings of Executive Committee, 2,000 volumes of the reports of Baltimore convention, 500 notifications for St. Louis convention, 1,500 iron pipe agreements. In all it shows a busy year marked with great progress for so young an association. It is probably not equaled by any similar association having such great questions as its especial care.

THE THIRD ANNUAL CONVENTION.

The Third Annual Convention of the National Association of Master Plumbers was called to order by Jeremiah Sheehan in Odd Fellows Hall, St. Louis, Mo., at 11 o'clock A. M., June 23, 1885. He welcomed the members on behalf of the St. Louis Association and introduced President Andrew Young who delivered a short and pointed address and at once kindled the fires of enthusiasm. The Committee on Credentials reported delegates present from the following: Alton, Ill., Birmingham, Baltimore, Boston, Brooklyn, Chicago, Cincinnati, Columbus, Cedar Rapids, Denver, Des Moines, Sprinfield, Mass., Hudson County, N. J., Kansas City, Leavenworth, Muscatine, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburg, St. Louis, Washington, St. Paul, Madison, Wis., Providence, Louisville, Memphis, Omaha, Canton.

The Executive Committee recommended the adoption of the following:

WHEREAS, The National Association of Master Plumbers, in Convention assembled in Baltimore, June 25, 1884, in view of the numerous false relations which have sprung up between the manufacturers, plumbers and consumers, whereby confusion and injustice have been produced, after much thought and discussion, passed a resolution whereby their relative rights and duties have been more clearly defined, and,

WHEREAS, The manufacturers, with but few exceptions, have adopted the resolutions as their rule of conduct, now, therefore, in justice to ourselves and in honor toward the co-operating manufacturers, we recommend the following:

Resolved, That it is the plain duty of this association to maintain and enforce the integrity of the Baltimore Resolutions, and that all members of the craft, in self-defence, be requested to withdraw further patronage from dissenting manufacturers, and stand by those who stand by us.

The report of the Recording Secretary showed receipts, $1,779.42, and equal disbursements. The Treasurer's report showed receipts $2,672.01. Expenditures, $2,664.43. The Financial Secretary reported receipts, $2,296. The reports of the State Vice-Presidents showed satisfactory progress.

The following officers were elected: President, James Allison; First Vice-President, George R. Phillips; Recording Secretary, Thomas McNeil; Treasurer, M. J. Lyons; Corresponding Secretary, James Semple; Financial Secretary, Enoch Remick; Sergeant-at-Arms, George F. Uper. Executive Committee—James Allison, George R. Phillips, Thomas McNeil, M. J. Lyons, J. W. Birkett, Col. George D. Scott, J. J. Weaver, Andrew Young, William H. Graham. State Vice-Presidents—R. Knauff, Ala.; J. Shepard, Cal.; H. A. Holmes, Colo.; Robert Morgan, Conn.; Allen Speakman, Del.; E. J. Hannan, Washington, D. C.; William McGraw, Ill.; N. J. Barry, Ia.; Ed Plumber, Ind.; W. H. Matlack, Ky.; J. J. Foley, Kan.; John Trainor, Md.; Isaac Riley, Mass.; J. F. Holmes, Minn.; J. P. Gallagher, Mo.; D. O. McEwen, Neb.; J. Zumbush, N. J.; John Mitchell, N. Y.; E. A. Futerer, O.; J. P. Reinecke, Penn.; Thomas Phillips, R. I.; J. W. X. Brown, Tenn.; W. E. Goodman, Wis.

The following papers were presented:

"The Plumber as a Sanitary Expert," James Allison, Cin-

cinnati; "Technical Education the Need of the Plumber," William Halley, Colsmbus; "Trade Interest," Brooklyn; "The Manufacturer and the Plumber; Are their Interests Mutual?" Martin Moylan, Chicago; "International Associations," New York; "What Can the Plumber Do to Prevent Cholera?" W. H. Matlack, Louisville; "The Future of the Manufacturers of Plumbing Supplies in the West," J. L. Ryle, Kansas City; "Is Lead as a Conduit for Water Detrimental to Health," J. P. Gallagher, St. Louis; "The Protection of Plumbing Against the Elements," E. C. Cauvet, Minneapolis; "The Relation of Masters to Apprentices," Thomas Phillips, Providence; "Householder vs. Plumber," C. H. Humbert, Pittsburg; "Separate vs. Combined System of Sewerage," J. F. McConnell, Baltimore; "Is Plumbing the Most Essential Part of a Building," A. N. Riley, Boston; "The Plumber of 1985," J. J. Dunnigan, St. Paul.

The place for holding the next meeting was referred to the Executive Committee and the convention adjourned.

JUNE, 1885—JUNE, 1886.

At this time there are to be found many evidences of progress outside of the association. Public sentiment was turning fast to the support of the cause and the principles represented, and as the full scope and aims of the association became better understood the wider grew its importance and more highly was it appreciated. Boards of health, municipal authorities, and legislative bodies gave the cause a wider recognition and speech in regard to it was tempered with regard and well wishes. The attitude of manufacturers and dealers had changed to a marked degree, the tone of the press altered remarkably in the support of the purposes of the organization and a new branch of the press was in existence advocating the cause of plumbing and allied sciences. So numerous was this class of journals that the association preferred their united aid and withheld any action favoring a special organ. Trade schools received an added impetus and they increased in usefulness and numbers. Cities were paying greater attention to sanitation, and the recognition of plumbing as a science was the logical result. These substantial evidences of

JAMES ALLISON, THIRD AND FOURTH PRESIDENT, N. A. M. P.

progress and the development of a healthy public sentiment were observable on every hand evidencing the good work accomplished. Trade protection as a principle had been established and all that was left was the nicer adjustment of the plan to differing conditions and harmonizing of the whole with its individual parts. The revolution had come, swept over the country in gathering strength, and now there was simply a settling down to the new order of things. Organization had born its fruits, faith had been established, doubters convinced, and in the establishment of this new order of affairs the whole country had been blessed.

Organization had extended until state associations were forming, Minnesota leading off in this direction. Through the Executive Committee and the State Vice-Presidents new associations were formed and the gradual growth of the National Association was marked.

The first meeting of the Executive Committee was held in New York, August 26. The members of the Auditing, Sanitary, Legislative, Apprenticeship, Essay and Conference Committees were selected. The per capita tax was fixed at two dollars. Deer Park, Md., was selected as the place and June 22, as the time for holding the next convention. The resolution offered by Andrew Young, "that the interpretation of the Baltimore Resolutions be left in the hands of the Executive Committee with power," received consideration and were interpreted as follows:

Resolved, That any firm manufacturing plumbing materials, selling to other than master plumbers, that we withdraw our patronage from such firm.

Resolved, That the master plumbers shall demand of the manufacturers and wholesale dealers in plumbing materials to sell goods to none but master plumbers.

Resolved, That this association keeps a record of all journeymen and plumbers who place in buildings plumbing material bought by consumers of manufacturers or dealers.

Resolved, That any manufacturing or wholesale dealers dealing in wrought-iron pipe who sell to consumers shall not receive our patronage.

Resolved, That it is not the intention of the foregoing resolution to prevent the interchange of patented or any other plumbing materials between manufacturers and wholesale dealers in such goods, or their sale or exchange for the export trade.

Resolved, That no local association shall make any other agreement with manufacturers or dealers than the above.

Resolved, That a committee be appointed by this association in every state and county, for the purpose of reporting to the proper officers at its head in the state any violation of these rules.

Resolved, That these measures are just and necessary to our welfare, and a rigid enforcement is demanded.

Resolved, That the conventien endorse the above, and urge the National Association to perfect and adopt a uniform system of protection for the trade over their entire jurisdiction.

The second meeting of the committee was held in New York December 17, and routine business transacted. The third meeting was held at Philadelphia, May 31, and arrangements made for the coming convention.

THE FOURTH ANNUAL CONVENTION.

The fourth annual convention met at Deer Park, Md., and was called to order by President Allison at 10:30 o'clock A. M. June 22, 1886. The Committee on Credentials reported delegates present as follows:

Alton, Ill.—P. I. Kane. Baltimore—John Trainor, Jno. A. Wilson, John F. Dwyer, H. C. Bowman, D. J. Barry, Thos. J. Griffin, John J. Carey. Boston—Isaac Riley, John H. Stevens, John Crawford, Daniel G. Finnerty, Thos. J. Tute, Henry Hussey, Frank A. Titus, John W. Casden, D. A. Horgon, James F. Davlin. Brooklyn—Geo. Cummings, J. W. Birkett, Thos. Hudson, G. B. Lewis, Mortimer Lyons, P. M. Moffatt, J. J. Keenan, W. Gardner, O. A. Marron, E. McNamara, C. A. Wagner, H. M. Noble, J. H. Radcliff. Canton, O.—U. D. Theobald. Chicago—P. Nacey, Martin Moylan, Andrew Young, Daniel Rock, J. J. Wade, Frank Ruh, Wm. Bowden, William Sims, C. J. Brooks, George Tipple, J. R. Alcock, D. Bain, J. J. Clark, Peter Willems, M. Ryan, M. J. Corboy, Robert Griffith, David Whiteford, T. C. Boyd. Cincinnati, O.—Richard Murphy, Stephen J. Nolan, Michael Burke, Wm. Lawson, James Semple, Robert Carlisle. Columbus, O.—E. A. Futerer. Hampden Co., Mass.—Maj. E. L. Knight, Springfield. Hudson Co., N. J.—Jos. Zumbusch, J. H. Kniffen, James F. Blackshaw, Thos. Bowes, Jersey City. Indianapolis, Ind.—J. Giles Smith, John C. Dunn. Kansas City, Mo.—R. B. Farley, Edgar B. Kay. Kansas State Association—James Foley, Leavenworth; W. P. McCarthy, Topeka, L. A. Beebe, Clay Center; Geo. W. Kite, Atchison. Louisville, Ky.—M. J. Duffy, Simon Shulhafer, W. H. Matlack. Milwaukee, Wis.—W. E. Goodman. Minneapolis, Minn.—A. W. Scott, J. P. Courtney, E. C. Cauvet. New Haven, Conn.—Daniel F. Kelley, Andrew J. Clerkin. New York City—John Byrns, John Mitchell, Frank Reynolds, John L. Pinkerton, John Miller, I. N. Knight, H. G. Gabay, E. J. Brady, Wm. H. Quick, T. Sullivan, Samuel Clark, Wm. J. Lightbody, J. A. Macdonald, J. O. Shumway, Alex. L. Whitelaw, John Renehan, Philip Smith, Wm. H. Richards, Wm. Young, Alexander Low, Cauldwell Frazer, Wm. Bishop, T. J. Tuomey. Norfolk, Va.—Maj. W. E. Foster. Philadelphia, Pa.—W. W. Mentzinger, Wm. M. Wright, John A. Heffron, Enoch Remick, Geo. F. Uber, Wm. McCoach. Wm. Harkness, John Worthington, Albert M. Hicks, J. E. Eyanson, Wm. L. Owens, John J. Weaver. Pittsburg, Pa.—R. C. Wilson, James Anderson, Frank McKnight, James Kennedy, James G. Weldon. Providence, R. I.—Patrick Tierney, Thos. Phillips, Wm. Whipple, Thos. A. Marrin. St. Louis, Mo.—James A. Lynch, J. P. Gallagher, David Roden, James McCartin, John A. Reardon, Wm. Norris, J. D. Collins, T. H. McMahon, Jeremiah Sheehan, William Schwer, O. J. Gerhard. Washington, D. C.—Edward J. Hannan, R. G. Campbell, James Ragan. Wheeling, W. Va.—John S. Trimble.

Much debate was occasioned in the convention over that part of the Executive Committee's report which interpreted the Baltimore Resolutions. It was referred to a special committee which

submitted a majority report, which was finally adopted as follows:

We recommend that in such localities where experience has proved that our members cannot at all times live up to the letter of the Baltimore Resolutions without serious injury to themselves, that discretionary power be allowed the local association, provided no action of theirs shall conflict with the spirit of these resolutions, and also provided the approval of the Executive Committee shall first be obtained thereto. We would also recommend that the manufacturers and dealers in plumbing supplies who have signed the Baltimore Resolutions, and carried out their spirit, and are in sympathy with the honest endeavors of the plumbing fraternity in raising the standard of their trade, deserve our co-operation and support, and we recommend them to the patronage of our fellow tradesmen.

To this J. J. Wade dissented and submitted a minority report protesting to the adoption of the recommendation granting discretionary powers to certain localities as presented in the above.

The report of the Recording Secretary showed expenditure of $672.62 for printing, stationery, mailmatter, etc.; a membership of 1,187, being a gain of 39 during the year.

The Financial Secretary reported receipts of $2,383.58. State Vice-Presidents reported from thirteen states. The Treasurer reported receipts $2,383.58; disbursements, $1,595,44.

The following esays were presented:

"The Progress of Plumbing," James H. Davlin, Boston; "Extra Work," Martin Moylan, Chicago; "Drainage of Privy Vaults," John J. McConnell, Baltimore; "Arbitration as a Means of Settling Disputes," Alexander, Low, New York; "History of the Bath," J. P. Gallagher, St. Louis; "Education of the Craft," the Philadelphia Association; "The Ideal Water Closet," The Brooklyn Association; "Purification of Water for Household Purposes," W. H. Matlack, Louisville; "The Water Supply of a County Mansion," Edwin S. Knight, Springfield; "The Educational Qualifications of the Master Plumber," Columbus Association; "Should Sanitation Be Fostered by Legislation?" James Semple, Cincinnati; "Sewer Gas and How to Detect It," Charles H. Humbert, Pittsburg.

The following officers were elected:

President, James Allison; First Vice-President, John Trainor; Recording Secretary, Thomas McNeil; Treasurer, N. J. Lyons, Corresponding Secretary, James Semple; Financial Secretary, Enoch Remick; Sergeant-at-Arms, David J. Collins. Executive Committee—James Allison, John Trainor, Thomas McNeil, N. J. Lyons, J. A. Macdonald, J. J. Weaver, Geo. R. Phillips, J. W. Birkett, T. C. Boyd. State Vice-Presidents—Felix McCosper, Ala.; J. Shepard, Cal.; H. H. Holmes, Colo.; E. J. Hannan, D. C.; Robert Morgan, Conn.; P. J. Kane, Ill.; J. G. Smith, Ind.; N. J. Barry, Ia.; W. H. Matlack, Ky.; G. W. Kite, Kans.; T. J. Griffin, Md.; D. G. Finnerty, Mass.; E. C. Cauvet, Minn.; J. P. Gallegher, Mo.; J. F. Blackshaw, N. J.; Geo. Cummings, N. Y.; Wm. Picketts, O.; J. P. Reineke, Penn.; Patrick Tierney, R. I.; W. E. Goodman, Wis.; J. Meathe, Mich.; W. E. Foster, Va.; Allen Speakman, Del.; J. H. Aitken, La.; J. W. X. Brown, Tenn.; D. O. McEwan, Neb.

After reports from several local associations, Chicago was selected as the place to hold the next convention, and the convention adjourned.

JUNE, 1886—JUNE, 1887.

The progress of the previous year did not abate in the present. The influence of the association was more widely extended, and it touched many allied interests greatly to their improvement. There is no doubt that this association has been the direct cause of securing better boards of health, better sanitary laws, better education, and a healthier, stronger public sentiment regarding sanitary affairs. The effect of the association on the public has been salutary, and its influence on the plumbing fraternity has been unmeasurably good. The great principles of education, justice and broad liberality which have found a permanent abiding place in the association, have placed the profession on a high plain of respectability and honor, and won from the public mind its warmest approbation.

The total membership had increased during the year to 1,360, and local associations had increased and extended to new states. Among the matters of interest for the year were the rules of the Apprenticeship Committee which were adopted as follows:

1. The term of apprenticeship at the plumbing trade shall be five years.

2. No boy shall be taken to learn the trade until he has attained the age of 16 years.

3. Each employer shall be required to make a return to the apprenticeship committee of a list of the boys in his employ as apprentices, with their ages, places of residence, time of commencing at the trade, etc., and a general record of each boy.

4. The secretary of the apprenticeship committee will keep an apprentices' record, in which will be recorded the name, address and age of every apprentice, with date of commencing and discontinuing work with each employer.

5. For each apprentice so recorded the secretary shall issue an apprentice certificate to be sent to his (the boy's) employer to be retained by him so long as the apprentice is in his employ. When the apprentice takes service in another shop the certificate is given to his new employer to be filled in with the date of commencement (of service) and so on until the certificate shows that the proper time has been served.

6. Any boy wishing to learn the plumbing trade will be required to send his name and address to the secretary of the apprenticeship committee, who will notify the applicant when to appear before the committee for examination. Each applicant must have a letter of recommendation from a member of the Master Plumbers' association.

7. A beginner at the trade will be required to work six months on probation, at the end of which he shall appear before the committee for re-examination, and if found worthy his certificate shall be recognized as a regular apprentice, and the time already spent at the trade shall be issued, he shall be allowed on his certificate.

8. When the five years shall have been served, the apprentice shall be presented by the association with a diploma, showing the date of service and signed by the president of the association and by the apprenticeship committee.

9. Boys having a diploma from any trade school shall be allowed a deduction of the last year from the term of apprenticeship.

10. It shall be the duty of each employer, when he finds it necessary to dispense with the services of any apprentice, to report to the secretary the name of such apprentice at least one week before laying him off.

11. It shall also be the duty of the members of this association to apply to the commitee when in need of apprentices.

12. No boy shall be allowed to join any trade or labor organization during his term of apprenticeship under penalty of forfeiture of his certificate.

13. If a Master Plumber is compelled to discharge an apprentice for want of work, it should be his duty to find him employment with another who has work for him and can teach him the trade.

Four meetings of the Executive Committee were held during the year. The first at New York, October 4, the second at Washington, D. C., December 2, where the plumbing regulations for the District were considered and attention given the labor troubles then existing, principally in New York. At the next meeting the following resolution was adopted:

Resolved, That the National Association, through its Executive head, appoint a member of this organization in every city and town in the United States under its jurisdiction, for the purpose of keeping a record of all dealers, manufacterers or master plumbers violating any of the protective resolutions of this association, said committee to report to the chairman on protection.

THE FIFTH ANNUAL CONVENTION.

The Fifth Annual Convention was held at Chicago, June 21, 22, 23, 1887. The convention was called to order at 11:20 A. M., June 21, by President Allison. The members were welcomed by Andrew Young in behalf of the Chicago Association.

The Committee on Credentials reported the following delegates present:

Alton, Ill.—One representative—P. J. Kane. Beatrice, Neb.—One Representative—Frank Barclay. Bloomington, Ill.—Two representatives—Frank Morrison, George McIntosh. Brooklyn, N. Y.—Seven representatives—Mortimer J. Lyons, T. H. Radcliffe, H. M. Noble, W. T. Hudson, J. J. Keenan, O. Marrin, D. Fragman. Burlington, Ia.—One representative—Henry Erwinger. Baltimore, Md.—Nine representatives—William Dunnett, president; delegates, D. B. Foster, George Knipp, Wm. H. Rothrock, John Trainor, James Millar, Jr., Joseph C. Mitchell, John McCart, James Connelly. Boston, Mass.—Nine representatives—John H. Stevens, president; delegates, Isaac Riley, John Crawford, D. G. Finnerty, Wm. H. Mitchell, James F. Dacey, Thomas J. Tute, E. G. Perkins, Frank A. Titus. Chicago—Eighteen representatives—Robert Griffith, president; delegates, A. W. Murray, Martin Moylan, William Sims, T. C. Boyd, Hugh Watt, Michael Ryan, D. J. Rock, David Whiteford, William Bowden, T. O'Malley, Rupert Coleman, Patrick Sanders, Joseph R. Alcock, Michael J. Corboy, William Wilson, Andrew Young and J. J. Wade. Cincinnati, O.—Six representatives—Robert Carlisle, president; delegates, Richard Murphy, Stephen Nolan, James Allison, James A. Gibson, Thomas McNeil. Columbus, O.—Two representatives—William Halley, president; delegate, E. A. Futerer. Clinton, Iowa—One representative—George Kendall. Canton, O.—One representative—L. B. Cross. Cleveland, O.—Three representatives—George S. Paine, president; Charles C. Dewstoe, Peter Desnoyers. Davenport, Iowa—One representative—James Cameron. Decatur, Ill.—One representative—Phillip Mueller. Detroit, Mich.—Five representatives—James Meathe, president; delegates, James Lane, John Cameron, J. H Crumley, Richard Walsh. Denver, Col.—Three representatives—Thomas J. White, president; delegates, William McCarthy, William Crane. Flint, Mich.—One representative—Edwin Sterner. Fort Wayne, Ind.—Two representatives—Thomas Madden, P. E. Cox. Freeport, Ill.—One representative—Charles Stetson. Hampden Co., Mass.—One representative—C. P. Lyman. Grand Rapids, Mich.—One representative—Robert Sproul. Hudson Co., N. J.—Three representatives—Joseph Zumbush; James F. Blackshaw, D. W. Littell. Jacksonville, Ill.—One representative—George E. Matthews. Kansas State Association—Four representatives—W. F. McCarthy, and J. J. Sheehan, Topeka; John E. Ford, Newton; J. Giles Smith, Wichita. Kansas City.—Four representatives—J. L. Ryle, Henry Goss, W. G. Ashdown, R. B. Farley. Louisville, Ky.—Four representatives—M. J. Duffy, president; W. H. Matlack, Thomas P. Watts, Simon Shulhafer. Lincoln, Neb.—One representative—James H. O'Neil. Madison, Wis.—One representative—

Thomas Regan. Milwaukee, Wis.—Five representatives—Wm. E. Goodman, Hermann C. Apel, George S. Lyons, George A. Spence, Charles Polacheck. Minneapolis, Minn.—Three representatives—E. C. Cauvet. J. S. Cusick, A. W. Scott. New Haven, Conn.—Two representatives—Andrew J. Clerkin, Franklin A. Curtis. Norfolk, Va.—One representative—Wm. E. Foster. New York City—Twenty-four representatives—John Byrns, president; delegates, Joseph A. Macdonald, Jonas A. Rossman, Alexander L. Whitelaw, William Austin, Frank Reynolds, Thomas Cochrane, Philip Smith, H. G. Gabay, Col. George D. Scott, George B. Brown, William Young, E. J. Brady, T. Sullivan, T. J. Tuomey, James Fay, John Miller, J. J. Sullivan, T. J. Cummings, E. J. O'Connor, W. H. Quick, J. N. Knight, C. H. Kranichfelt, Cauldwell Fraser. Omaha, Neb.—One representative—John Rowe. Providence, R. I.—Two representatives—Delegates, George R. Phillips, Thomas Phillips. Pittsburg, Penn.—Five representatives—John M. Tate, president; delegates, Washington Jarvis, R. J. Bradshaw, James J. Ricketts, Louis Heilig. Philadelphia, Penn.—Seven representatives—John J. Weaver, Enoch Remick, William M. Wright, William McCoach, William Harkness, Jr., H. A. W. Smith, J. Sellers Kite. St. Paul, Minn.—Three representatives—John H. Shea, George Dempsey, J. J. Dunnegan. St. Louis, Mo.—Thirteen representatives—Jeremiah Sheehan, president; delegates, David Roden, James A. Lynch, David J. Collins, Thomas Cantwell, William Norris, Arthur Boyce, James McCartin, John Quinn, Oscar J. Gerhard, P. C. Ring, T. H. McMahon, J. F. Reardon. Washinton, D. C.—Three representatives—R. G. Campbell, president; delegates, Edward J. Hannan, James Ragan; alternates, James Lockhead and George E. Hutchins.

The Financial Secretary reported receipts to the amount of $2,720. The Treasurer reported receipts $2,744.29; disbursements, $1,875.19. Vice-Presidents' reports were received from ten states.

The following officers were elected:

President, John Byrns; First Vice-President, John Trainor; Recording Secretary, H. G. Gabay; Treasurer, M. J. Lyons; Corresponding Secretary, W. F. Hudson; Financial Secretary, Enoch Remick; Sergeant-at-Arms, D. J. Collins. Executive Committee—John Byrns, John Trainor, H. G. Gabay, M. J. Lyons, Col. George D. Scott, E. J. Hannan, Jeremiah Sheehan, William Harkness, Rupert Coleman.

State Vice-Presidents.

Illinois—A. W. Murray. Massachusetts—D. G. Finnerty. Nebraska—D. O. McEwan. Maryland—Joseph C. Mitchell. Ohio.—Richard Murphy. Colorado—Thomas J. White. Michigan, John Cameron. Indiana—James Madden. New Jersey—Michael J. Moran. Missouri—Henry Goss. Kansas—John E. Ford, Wisconsin—W. E. Goodman. Minnesota—John Shea. Connecticut—Robert Morgan. Virginia—W. E. Foster. Pennsylvania—James G. Weldon. Tennessee—J. L. Park. Rhode Island—William Whipple. District of Columbia—R. G. Campbell. California—J. L. E. Firmin.

The Manufacturers' Association of Metal Workers sought at this time to procure some change or modification of the Baltimore Resolutions allowing them to sell to certain parties at a fixed price, but the association did not recede from the resolutions under which they received protection for the trade.

The following papers were presented:

"Trade Schools and Technical Education in their Relations to the Plumber of the Future," New York; "Is a Trap on the Main Drain Necessary? Fresh-Air Inlets, their Location and Termination," Richard Murphy, Cincinnati; "In the Interest of Public Health, should the Plumbing Business Be Regulated by Legislation?" J. J. Wade, Chicago; "Foot-Vents—Their Location and Termination," J. G. Smith, Kansas State; "Local Associations—Their True Relation to the National Association," J. L. E. Firmin, San Francisco; "Is the Trap of the Main Drain Necessary?" Wm. Dunnett, Baltimore.

Boston having been selected for the next place of meeting, the convention adjourned.

JUNE, 1887—JUNE, 1888.

The progress made during this year was satisfactory. Fifteen new associations were organized as follows: Buffalo, Rochester, Syracuse, Albany, Troy, Cohoes, Elmira, N. Y.; Bridgeport, Conn.; Harrisburg, Pa.; New Bradford, Mass.; Woonsocket, R. I.; Newark and Patterson, N. J.; Lincoln, Neb.; St. Joseph, Mo. In twelve other places work of organization had so far progressed that the establishment of associations in these places was an assured fact. Membership was greatly increased and the principles on which the association was founded reached into new territory and became more deeply and firmly rooted throughout the country.

The Executive Committee held eight meetings during the year.

The first was at Chicago, June 23, 1887, at which a grand secretary was appointed, and a printing committee elected, which was authorized to publish 1,500 copies of the proceedings of the fifth annual convention.

The second meeting was held in New York, September 26, 1887. Correspondence had with the terra cotta manufacturers, relative to placing master plumbers on the same plane as dealers in the matter of discounts, was considered and approved. The third and fourth meetings were held in New York on December 6 and 27, 1887, and the fifth at Philadelphia, January 12, 1888. A special report on the question of a breach of agreement on the part of a

JOHN BYRNS, FIFTH PRESIDENT N. A. M. P.

local dealer with the Philadelphia association was made. The sixth meeting was held in New York, May 7, at which time the services of the grand secretary were dispensed with, and steps were taken to secure the organization of new associations. The seventh and eighth meetings were held at Boston, June 25 and 27, at which reports of a very encouraging character were presented. Notably among these was a report of an agreement entered into between eleven of the leading manufacturers and dealers in plumbing material in Brooklyn and the master plumbers' association of that city, by which the former bound themselves on and after April 20, 1888, not to sell plumbing goods directly or indirectly to any person except a licensed plumber having a shop, or to give estimates on original plans or specifications, as prepared by a builder or architect. An appeal was also presented on behalf of the Baltimore Master Plumbers' association, urging the national executive to take action in the matter of the association of manufacturers of plumbing materials classing firms and individuals engaged in the construction of plumbing work as preferred dealers in plumbing materials. The good offices of the executive committee were also invoked to induce the aforesaid association of manufacturers to class the members of the national association with jobbers in purchasing material used in their business.

The committee submitted the following recommendations:

1. That the office of grand secretary be abolished, and that of clerk to the executive committee be substituted therefor.

2. That the office of corresponding secretary be abolished, and the duties thereof be incorporated with those of the recording secretary.

3. That the auditing committee as a standing committee be abolished, and that the convention select an auditing committee of three delegates from the convention when in session.

4. That the conference committee be abolished.

5. That the sanitary committee be composed of three members instead of the state vice-presidents.

6. That all succeeding executive committees shall consist of eleven, viz., president, vice-president, secretary, treasurer, financial secretary and retiring president, and five delegates-at-large.

7. That only persons elected as delegates by the local associations, shall be eligible for office in the National association. This clause to take effect immediately after the adjournment of this convention.

8. That members of standing committees (other than the executive committee) shall not be added to nor included in the list of officers of the national associations, and that they shall make their reports in writing, when required by the president.

9. That only one local association be recognized in any one city or town.

10. That the president shall have the power to call the convention into executive session, for the consideration of such matters as he may deem advisable.

THE SIXTH ANNUAL CONVENTION.

The Sixth Annual Convention was held at Boston, June 26, 27 and 28, 1888. The meeting was called to order by President Byrns at 10:45 A. M., Tuesday, June 26.

The committee on credentials reported delegates present as follows:

Alton, Ill.—P. J. Kane, R. J. Nickson, Albany, N. Y.—J. Edward Jones, P. J. McGoldrick, Thomas Hyde. Amsterdam, N. Y.—John W. Dwyer. Baltimore, Md.—John Trainor, W. H. Rothrock, George Knipp, Joseph C. Mitchell, Henry C. Bowman, P. T. Barry, D. B. Foster, William Dunnett, John J. Carey. Burlington, Ia.—Henry Erwinger. Bridgeport, Conn.—Zalmon Goodsell, M. R. Leavenworth, Alfred Hopkins. Brattleboro, Vt.—J. F. Anderson. Boston, Mass.—H. H. Collins, John E. McCourt, W. H. French, Florence Sullivan, A. E. Kendrick, Thomas McDonald, Daniel Shannon, Thomas J. Tute, W. S. Locke, Edwin Mills, Edward Moore, E. G. Perkins, James F. Davlin, D. G. Finnerty. Beatrice, Neb.—F. W. Barclay. Bloomington, Ill.—Robert Loudon. Brooklyn, N. Y.—W. E. O'Keefe, George B. Lewis, Martin Fallon, Owen Marron, David Tragman, Thomas Kelly, John Hay, George Cummings, Thomas H. Radcliffe, John J. Keenan, P. M. Moffett, E. McNamara. Buffalo, N. Y.—L. P. Beyer, E. L. Cook, F. H. Yuhl, Charles Geiger. Columbus, O.—William Halley. Clinton, Iowa.—George Kendall. Chicago—Andrew Young, Robert Griffith, Martin Moylan, Daniel Rock, David Whiteford, J. R. Alcock, T. C. Boyd, D. Bain, J. J. Wade, P. Nacey, William Sims, P. Sanders, Hugh Watt, J. J. Clark, J. H. Roche, J. L. Pattison, C. J. Herbert, C. Breyer. Cincinnati, O.—John W. Kirk, Richard Murphy, Hugh McCullom, S. J. Nolan, James A. Gibson. Cohoes, N. Y.—John B. Goblen, H. E. Boltum. Charleston, S. C.—Richard S. Long. Cleveland, O.—James Desnoyers, A. G. Daykin. Denver, Col.—Frank H. Paradice, T. J White, M. A. Doland, Archie Davies. Elmira, N. Y.—John T. Sadder, R. H. Walker, James Walker. Flint, Mich.—Edwin Sterner. Fort Wayne, Ind.—James Madden. Harrisburg, Pa.—J. W. Neal, E. C. Rauch, J. A. Cramer, James H. Lutz. Hudson County, N. J.—Joseph Zambusch, J. H. Blackshaw, M. P. Moran. Helena, Mont.—Arthur O'Brien. Kansas City—Henry Goss, E. D. Hornbrook, Dent Yates, W. G. Ashdown. Kansas State—W. F. McCarthy, James Foley, James McLennan, John Sheehan, C. J. Prescott. Louisville, Ky.—Simon Shulhafer. Linco'n, Neb.—James H. O'Neil. Lambertville, N. J.—A. C. Goudey. Madison, Wis.—Thomas Regan. Milwaukee, Wis.—George S. Lyon, W. E. Goodman, Charles Polacheck. Montpelier, Vt.—P. L. Lyons. New York—W. P. Austin, John Byrns, Geo. B. Brown, E. J. Brady, T. J. Cummings, C. Frazer, H. G. Gabay, James Gilroy, J. Keppel, C. H. Kranichfelt, J. A. Macdonald, E. Murphy, Jas. Muir, John Mitchell, Jos. Murphy, E. S. O'Connor, W. H. Quick, J. A. Rossman, F. Reynolds, G. D. Scott, T. Sullivan, P. Smith, T. J. Toumey, A. L. Whitelaw, W. Young, J. McCarron. Norfolk, Va.—William E. Foster.—Nashville, Tenn.—T. J. Mooney, G. Demerick. New Haven, Conn.—Robert Morgan, S. E. Dibble, Geo. S. Arnold. New Bedford, Mass.—Thomas J. Gifford, F. N. Gifford, J. H. Sherman. New London, Conn.—B. H. Hillier. Omaha, Neb.—A. B. Hussey, M. A. Free. Providence, R. I.—Wm. L. Whipple. Ocean Grove, N. J.—J. S. Flitcraft. Pittsburg, Pa.—J. G. Weldon, S. W. Hare, George Addy, Charles H. Humbert, George Sands, J. L. McShane, T. J. Kennedy. Plainfield, N. J.—D. W. Littell, C. W. Krausse, J. H. Kearney. Philadelphia, Pa.—Wm. Harkness, Jr., John J. Weaver, Enoch Remick, William McCoach, Geo. F. Uber, William H. Dietz, William M. Wright, Frank B. Brown, William H. Doyle, A. G. Bond, A. M. Hicks. Portsmouth, Va.—Edward Powell. Rochester, N. Y.—William G. Ried, William T. Bassett, Edward T. Rice, P. J. Madden. Rockford, Ill.—Samuel N. Jones. St. Paul, Minn.—J. J. Dunnigan. St. Louis, Mo.—William Norris, Jeremiah Sheehan, D. J. Collins, John Frost, William Morris, Henry Whitney, Thomas Cantwell, John McMahon, William J. Ward, John F. Reardon, Richard Norris, Isaac Conran. Syracuse, N. Y.—R. E. McClellan, Edward Joy, Alfred Tiley. Troy, N. Y.—Harrison Schermerhorn, Wm. Ferguson, Wm. H Barnes, John J. Purcell. Washington, D. C.—John Mitchell, E. J. Hannon, A. G. Campbell. Woonsocket, R. I.—J. F. Mulvey, E. H. Barry. Worcester, Mass.—J. W. Jordan, J. W. Green. Total, 221.

Vice-presidents reported from sixteen states. The Apprenticeship Committee reported for approval the report on apprenticeship adopted by the National Association of Builders at Cincinnati, February 8, 1888. The financial secretary reported receipts, $2,912. The treasurer reported receipts, $3,781.10; expenditures, $2,734.89.

The following officers were elected for the ensuing year:

President, John Trainor, Baltimore; Vice-President, E. J. Hannan, Washington; Secretary, John J. Carey, Baltimore; Financial Secretary, Enoch Remick, Philadelphia; Treasurer, John J. Hamblin, Chicago; Sergeant-at-Arms, David J. Collins, St. Louis.

Executive Committe—John Trainor, president, Baltimore; E. J. Hannan, vice-president, Washington; John J. Carey, secretary, Baltimore; John J. Hamblin, treasurer, Chicago; Enoch Remick, financial secretary, Philadelphia; M. J. Byrns, retiring president; Isaac Riley, Boston; W. F. McCarthy, Topeka; W. H. Rothrock, Baltimore; J. G. Weldon, Pittsburg; James Allison, Cincinnati.

State Vice-Presidents—Colorado, T. J. White, Denver; Connecticut, George S. Arnold, Hartford; District of Columbia, John Mitchell, Washington; Illinois, Robert Griffith, Chicago; Iowa, George Kendall, Clinton; Kansas, Jas. Foley, Leavenworth; Kentucky, Simon Shulhafer, Louisville; Maryland, J. C. Mitchell, Baltimore; Massachusetts, Thomas J. Tute, Boston; Minnesota, J. J. Dunnigan, St. Paul; Missouri, Henry Goss, Kansas City; Nebraska, M. B. Hussey, Omaha; New Jersey, D. W. Littell; New York, W. G. Reid, Rochester; Ohio, Mr. Snyder, Cleveland; Pennsylvania, William M. Wright, Philadelphia; Rhode Island, William L. Whipple, Providence; Tennessee, T. J. Mooney, Nashville; Virginia, W. E. Foster, Norfolk; Wisconsin, George S. Lyon, Milwaukee.

The following papers were presented:

"Union is Strength," J. J. Wade, Chicago; "The Qualifications Necessary for Conducting the Plumbing Business," Kanas; "Truth Conquers," J. J. Wade, Chicago; "Notes on Familiar Methods of Calculating the Flow of Water Through Pipes," New York; "Wasted Sunbeams—Unused Hose-Tops," John M. Macdonald; "Qualifications for Conducting the Plumbing Business," J. L. E. Firmin; "Separate vs. Combination of Sewerage and Drainage," J. L. E. Firmin.

Pittsburg being selected for the next meeting, the convention adjourned.

JUNE, 1888—JUNE, 1889.

With the beginning of this year the fruits of organization were again observed and the strength and triumph of sound principles and justice realized. Through the instrumentality of the association New York, Brooklyn and Washington, completed arrangements with dealers which secured the plumbers of these cities fair protection. The work was extended in other directions and the power of the association again verified. This matter was no longer an experiment, but a solid fact. Protection was established not only as a principle, but as a practical business arrangement, a demonstrated truth, a tangible fact.

The work of organization still progressed and the year saw added to the national body the following local associations: Lowell, Mass., 11 members; Washington, Del., 12; Sioux City, Ia., 6; Davenport, Ia., 5; DesMoines, Ia., 6; Utica, N. Y., 5; Oswego, N. Y., 14; Elizabeth, N. J., 3; Portland, Ore., 9; San Diego, Cal.; Paterson, N. J., 28; New London, Conn., 6; and Rhode Island, 3.

JOHN TRAINOR, SIXTH PRESIDENT, N. A. M. P.

The Executive Committee held five meetings during the year; the first at Downey's Landing, Boston Harbor, June 29, 1888. At that meeting the secretary was instructed to correspond with all local associations and get a complete list of their members, and have the same printed in a small book for the use of manufacturers and dealers, and the information of the members. After considerable correspondence and labor the book was printed and issued; it is not perfect, but as nearly so as could be made

with the information received up to January 1, 1889. (Number of books printed 4,000).

The usual Printing Committee was elected and empowered to have 2,000 annual reports printed, as also necessary stationery. An Auditing Committee of two, appointed to pass upon all bills before being paid by the treasurer, and sub-committee of four to carry out the instructions of the convention.

The second meeting was held at the Hotel Revert, Baltimore, Md., September 20, 1888, all the members being present except Mr. Allison; Mr. Harkness of Philadelphia acted as proxy for him. Several agreements were presented and ratified; namely, Boston, Kansas State Associations, and the Manufacturers' Association.

The question of incorporating was referred to a committee of two. They reported at the third meeting. After considering the question and taking legal advice they reported adversely.

The bond of the treasurer was fixed at $2,000, and the financial secretary at $500, and they were received and accepted.

The president was authorized to delegate members to form local associations, and to pay their actual expenses for attending to same.

The third meeting was held at Green's Hotel, Philadelphia, February 13 and 14, 1889. The committee was in session two days, holding day and evening sessions.

At the request of the president, full and complete reports were received from thirteen state vice-presidents out of twenty-five elected at the last convention. The names of those replying, are: Foley of Kansas, Goss of Missouri, Tute of Massachusetts, Reid of New York, Hussey of Nebraska, Kendall of Iowa, Griffith of Illinois, Mooney of Tennessee, Shulhafer of Kentucky, Whipple ot Rhode Island, Lyon of Wisconsin, Littell of New Jersey, and Mitchell of Washington, D. C.

These reports contained much valuable information, and enabled the committee to understand the needs of the trade in their several localities, and the president was empowered to apply the proper remedies, which has since been done, and has produced most satisfactory and beneficial results.

The action of the president in calling for these semi-annual reports from the state vice-presidents was heartily commended, and it was recommend that they be urged to send in reports promptly when called upon, and any officer failing to perform this or any other important duty, that the president have power to remove him, subject to the approval of the Executive Committee, and appoint a successor in the same manner.

The question of the long-existing trouble in Milwaukee surrounding the trade was considered at this meeting. After a thorough examination of witnesses and a searching examination of documentary evidence, it was finally determined by unanimous vote that the Milwaukee Association was entitled to support in the position taken by it; that a person cannot be master and journeyman at the same time.

At this meeting Messrs. Hamblin, Young, and Murray, of Chicago were authorized to convey the information gleaned at this meeting and the action of this committee to the Milwaukee Association, which they did most effectively.

It was recommended that a delegate be sent to the American Public Health Association from this convention.

Fourth meeting was held at the United States Hotel, New York February 15, 1889. At this meeting there was a large representation of manufacturers and dealers. Also, a like delegation of the New York Association. After introductions and an interchange of views, A. L. Foster, president of the Manufacturers Association, was elected chairman, and H. G. Gabay of the New York Association, secretary. This meeting appointed a joint committee to prepare and report an agreement, which was afterwards approved by this committee.

Fifth meeting was held at Seventh Avenue Hotel, Pittsburg, Pa., June 25, 1889. The amount of business transacted at this meeting, in addition to routine business, was the reading of correspondence on violations of protective regulations.

It was recommended that section 3 of the constitution be a mended by striking out the word "sergeant-at-arms" from the list of officers, and also section 8 of the by-laws by adding "and have power to appoint a sergeant-at-arms."

THE SEVENTH ANNUAL CONVENTION.

The Seventh Annual Convention was held at Pittsburg, Pa., June 25, 26 and 27, 1889. The convention was called to order by President Trainor at 10:55 A. M., June 25.

The Committee on Credentials reported delegates present as follows:

Albany, N. Y.—J. Edward Jones, T. E. Kerwin, Thomas Hyde. Baltimore, Md.—W. H. Rothrock, president; John Trainor, John J. Carey, Thomas Hibbitts, George Knipp, William Dunnett, D. J. Barry, John Mahony, W. W. Rowles. Beatrice, Neb.—Frank Barclay. Boston, Mass.—J. W. Casden, James F. Davlin, Daniel Shannon, F. J. Tuite, D. G. Finnerty, William Lumb, William Trainor, Isaac Riley, L. S. Hamby, Florence Sullivan, C. M. Brownizch, P. H. Winn, R. W. Shattuck, J. H. Hayes, E. W. Gage. Bridgeport, Conn.—L. H. Mills, president; John Kearns. Brooklyn, N. Y.—Thomas Hudson, president; Mortimer J. Lyons, George D. Lewis, John J. Keenan, W. J. Fitzpatrick, William Fitzpatrick, Jr. Buffalo, N. Y.—Louis P. Boyer, president, Fred Yuhl, Charles R. Carey, Jacob L. Mensch. Burlington, Iowa.—Henry Ewinger. Chesterton, Md.—Charles S. York, president. Chicago, Ill.—President, A. W. Murray; Treasurer, John J. Hamblin; National Association State Vice-President, Robert Griffith; Daniel Rock, P. Sanders, Hugh Watt, Michael Ryan, William Bowden, Andrew Young, David Bain, David Whiteford, Richard Graham, M. L. Mandable, Michael Reilly, C. J. Brooks, C. C. Breyer, P. J. Laughlin, Gustav Larsen, P. L. O'Hara. Cincinnati, Ohio.—Stephen J. Nolan, president; J. A. Douglas, N. K. Aylward, Thomas McNeill, Robert Carlisle. Cleveland, Ohio.—Adam Schneider, A. H. Paine, W. H. Cleveland. Columbus, Ohio.—William Halley, Charles F. Butler, and E. A. Futurer. (No local association.) Colorado.—T. J. White, W. F. McCarthy, Joseph Ratican, T. J. Morgan. Covington, Ky.—W. S. Nock. Decatur, Ill.—P. Mueller. Des Moines, Iowa.—No delegate. Elmira, N. Y.—James Walker. Elizabeth, N. J.—Charles Spittlehuse, James H. Faulker. Flint, Mich.—E. Sterner. Fort Wayne, Ind.—James M. Madden. Geneva, N. Y.—G. W. Johnson. Harrisburg, Pa.—J. Wesley Neill, president; John A. Kramer. Kansas.—James Foley, J. A. Bransfield, George W. Kite, Robert Wood, C. J. Prescott, Kansas City, Mo.—Henry Goss, president; F. J. Beesley, T. F. Hanley, T. F. Douglass, L. B. Cross. Lambertville, N. J.—A. C. Gandry. Louisville, Ky.—M. J. Duffy, Simon Shulhapo. Madison, Wis.—Thomas Ragan. Milwaukee, Wis.—Charles Polochek, W. E. Goodman, P. H. Murphy. New York—Joseph A. Macdonald, James Gilroy, John Byrns, James Muir, George D. Scott, Edward Murphy, John Mitchell, Jonas A. Rossman, Cauldwell Fraser, William Young, James N. Knight, John Miller, John McCarron, Patrick J. Andrews, Philip Smith, Edward J. Brady, William R. Brackin, Frank Reynolds, Thomas J. Cummings, Charles H. Kranichfelt, Thomas J. Tuomey, John S. Dunn, Leonard D. Hosford, David MacKay, Jr,, Michael Ryan, George B. Brown. Nashville, Tenn.—David Klemer, president; James A. Healey. New Haven, Conn.—John F. Moore, A. J. Clerkin. Newark, N. J.—Joseph Budd, F. Ross Sanford, H. E. Littell. Norfolk, Va.—W. E. Foster. Oswego, N. Y.—John Keefe, president; Walker Donovan. Omaha, Neb.—N. B. Hussey, president; D. Fitzpatrick. Parkersburg, W. Va.—Charles S. Turner. Paterson, N. J.—Matthew Newlin, president; A. J. Hayes, G. B. King. Philadelphia, Pa.—John E. Eyanson, president; William Harkness, Jr. John F. Uber, William McCoach, A. M. Hicks, Enoch Remick, J. J. Weaver, W. H. Doyle, W. M. Wright. Pittsburgh, Pa.—C. H. Humbert, president; James Hoy, John M. Tate, John P. Reineke, Frank P. Blyth, James J. Kennedy. Plainfield, N. J.—D. W. Little, president; C. W. Cramer. Portland, Ore.—T. J. Johnson, president; J. J. Owens, Rhode Island.—Thomas Phillipps. Rochester, N. Y.—W. G. Reid, president; J. Henry Howe, Thomas Ford, John Creelman. Springfield, Mo.—W. W. Cronin, president; Harry Cooper. St. Paul, Minn.—George Dempsey, James J. Dunnigan, John Shea. Summit, N. J.—Robert Mooney. St. Louis, Mo.—W. H. Graham, president; James A. Lynch, Thomas Cantwell, A. Boyd, James J. Fitzgerald, John McMahon, M. J. Ward, Jeremiah Sheehan, S. S. Dooley, H. Whitney, P. C. Ring, T. H. McMahon, David Roden, J. F. Reordon. Syracuse, N. Y.—Edward Joy, president; Charles G. Hanchett, R. C. McClure. Troy, N. Y.—Charles Wills, president; Martin Mulligan, James Semple. Utica, N. Y.—George H Hughes, Woodbury, N. J.—William Sofleiss. Washington, D. C.—John Mitchell, president; R. G. Campbell, George A. Green, Edward Caverly, George Hutchins, Edward J. Hannan. Wheeling W. Va.—John S. Trimble, Wilmington, Del.—John C. Brison, president; Harry A. Miller, Alfred Gawthrop. Hudson, County, N. J.—Joseph Zumbush, J. F. Blackshaw.

The Legislative Committee reported as follows:

In presenting our report we feel somewhat chagrined at not succeeding as well with our endeavors to help Washington as we did Philadelphia, when at Deer Park. You will remember that the law desired by Philadelphia was then in the hands of the Governor, and the request of the convention to sign the bill was granted. Washington was not so fortunate, and after repeated endeavors to get the bill away from the committee and before Congress, we found that it was probably pigeon-holed for life. We regret exceedingly that we could not get the opportunity to bring the best talent of the many associations of our land to bear on the representatives in Congress, and there is no doubt that the result would be as we desired. It is the only way that Washington can secure the much desired sanitary legislation. The representatives sent from all parts of the country, who are sent to Washington to legislate for their constitutents, meet with a duty to legislate for a city—the needs of which they know little. If Washington had a vote for or against this it might be different. We respectfully refer this matter to the incoming committee.

The desire for local legislation has led some to ask for laws and rules governing plumbing, and your committee has responded to such inquiries and sent all the information at hand. A circular letter was sent to all associations in affiliation with the National Association, asking for all legislative enactments, rules of municipalities, health departments, or city works, if any, so that a compilation of the laws, rules, etc., governing our trade could be at the disposal of any association needing assistance in the formation of laws or rules. We have received quite a number, and their perusal shows that there is a difference in the requirements of localities and mode of doing work, and we think it would be very beneficial if an explanation of

the modes of doing work and the experience that led to them were to accompany the rules of each locality. It would be a valuable compendium to give the future legislators, and be a benefit to the profession. There are those in these associations who have had experience in the formation of these rules, know of their workining for or against the purpose for which they were intended, and that experience would be exceedingly valuable to all.

State vice-presidents reported from twenty-two states.

The Apprenticeship Committee made the following report:

Your Apprenticeship Committee respectfully report that, at the request of the Apprenticeship Committee of the International Association of Journeymen Plumbers, on April 16, they held a conference with above named committee, which was pleasant and harmonious; the result being an expressed desire on the part of the Journeymen's Association to aid the National Association of Master Plumbers in seeing that the boys so get their trades, that when they become journeymen they will be creditable not only to themselves but their instructors.

The Apprenticeship Committee (which is the Legislative Committee, a standing committee to whom the subject was referred) of the National Association of Builders, taking as a ground work the system as reported by a former Apprenticeship Committee of this national body, have formulated a plan which will apply to apprentices in all trades, and believing that such a uniform system is desirable, we submit it as part of our report, and recommend it for approval by this body.

REPORT OF LEGISLATIVE COMMITTEE ON APPRENTICESHIP.

The Legislative Committee have thoroughly reviewed the method approved at the last convention, to take the place of the old system of apprenticeship, and recommend a slight change of wording in the second clause, and an important change in the third clause.

They herewith present the whole method as they recommend its modification, the changes proposed being printed in italics.

Method approved by the National Association of Builders to establish the right of any person to be known as a regular journeyman in the building trades:

1. The serving of a regular course of instruction in a mechanical trade school, and graduating therefrom with a certificate of proficiency granted by the same, under rules and regulations approved by a committee of master mechanics, who may unite in the management of said school.

2. *The preliminary training in the trade school to be followed by* a term of practice with an employer on actual work, this term to be at least one year less than the usual term of apprenticeship by virtue of the holding of a certificate of proficiency granted by a mechanical trade school; during this term of service the young man to beknown as a "Junior."

3. *Finally*, completion of the education of the mechanic to be ackowledged *after a proper examination has been passed before a Board of Examiners appointed for the purpose by the Association of Builders to which the employer may belong, or to whom the Junior may apply for examination*, by the issuance of a certificate *by* the *said* association, which shall state that the holder has passed through the prescribed course at the trade school, and the term of practice with an employer (name and location given) with satisfaction and credit, and is entitled to be received by all builders as a journeyman.

"Any young man who has received the certificate of proficiency" from the trade school may apply for the second examination before the board of examiners, and, if adjudged by them to be old enough, strong enough, and competent, may receive a special certificate, which shall state the facts in the case.

The committee also recommend that this method of the National Association be persistently agitated, and that a special committee be appointed to have the matter in charge,

Thomas Cantwell of St. Louis presented the report of the Sanitary Committee. The report referred to the new plumbing ordinance recently passed in Kansas City and of which all good plumbers were proud, knowing that it corrected abuses of long standing not confined to that city alone, but to every city in the Union. In St. Louis, after several years agitation, the City Council, with the recommendation of the Board of Public Improvements, passed an ordinance framed by the St. Louis association. The success achieved was due, the report said, to the untiring exertions of their esteemed president, W. H. Graham, and Jeremiah Sheehan. Thomas J. Hennessey, a practical plumber, is at the head of the department created, with a corps of competent assistants. The report referred in a pleasant manner to Chief Inspector Andrew Young of Chicago.

The financial secretary reported receipts, $3,043. The treasurer reported receipts, $4,089.21; expenditures, $3,220.57.

The following officers were elected for the ensuing year: President, Edward J. Hannan, Washington; Vice-President, Robert Griffith, Chicago; Secrerary, George A. Green, Washington; Treasurer, Jeremiah Sheehan, St. Louis; Financial Secretary, Enoch Remick, Philadelphia.

Executive Committee.—E. J. Hannan, president, Washington; Robert Griffith, vice-president, Chicago; George A. Green, secretary, Washington; Jeremiah Sheehan, treasurer, St. Louis; Enoch Remick, financial secretary, Philadelphia; John Trainor, retiring president, Baltimore; George D. Scott, New York; George B. Lewis, Brooklyn; Philip Murphy, Milwaukee; Charles Geiger, Buffalo; Daniel G. Finnerty, Boston.

State Vice-Presidents.—California, J. L. E. Firman, San Francisco; Colorado, T. J. Morgan, Pueblo; Connecticut, Lucius H. Mills; District of Columbia, Edward Caverly, Washington; Florida, William Clark, Jacksonville; Illinois, Michael H. Reilly, Chicago; Indiana, James Madden, Fort Wayne; Iowa, Hugh F. Hogan, Sioux City; Kansas, T. J. Bransfield, Leavenworth; Kentucky, Simon Shulhafer, Louisville; Maryland, William Rothrock, Baltimore; Maine, G. L. Learned, Waterville; Massachusetts, Daniel Shannon, Boston; Michigan, Edward Sterner, Flint; Minnesota, J. T. Holmes, St. Paul; Missouri, T. J. Beesly, Kansas City; New Jersey, H. E. Littell, Newark; Nebraska, N. B. Hussey, Omaha; New York, W. G. Reed, Rochester; Ohio, Peter Desnoyer, Cleveland; Pennsylvania, John A. Kramer, Harrisburg; Rhode Island, William M. Whipple, Providence; South Carolina; Richard S. Long, Charleston; Tennessee, T. J. Mooney, Nashville; Virginia, W. E. Foster, Norfolk; Vermont, P. L. Lyons, Montpelier; Wisconsin, W. E. Goodman, Milwaukee; West Virginia, J. S. Trimble, Wheeling.

The following papers were presented:

"The Relative and Comparative Merits of Cast and Wrought Iron Pipe and Fittings for Drainage Purposes," F. J. Beesley, Kansas City; "Pure Water—The Best Means of Obtaining it for Country Houses," James Pearson; "Advantages and Disadvantages of Various Motors for Raising Water to Elevations for Domestic Use," New York.

Denver, Colo., was selected as the next place of meeting and the convention adjourned.

JUNE 1889—JUNE, 1890.

The year embraced in the above dates was one of growth. The National Association of Master Plumbers was an established fact not only with the plumbers, but other building trades had marked its triumphs and followed its example, conforming as closely as possible to the line of action that had made this association a marvel of growth and deeds. The advancement of this year was mostly within the association. While its influence was still being extended and new achievements in its line of labor wrought, the struggle with outside opposing influences had practically ceased, and the association was comfortably resting on its

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laurels of victory, with time to turn its attention more directly to its own needs. Little complaint was heard of the violation of the protection resolutions, as the legitimate trade on both sides was harmoniously adjusted to the principle and practice of protection, and was satisfied and prosperous in the results.

The growth of the present year was marked by the following accessions: Memphis, Tenn., 12 members; Duluth, Minn., 7; Indianapolis, Ind., 16; Watertown, N. Y., 8; Erie, Pa., 8; La-Crosse, Wis., 4; Birmingham, Ala., 6; Salt Lake City, Utah, 10;

Jacksonville, Fla., Texarkana, Ark., Fargo, N. Dak., Barre, Vt., Huron, S. Dak., Glenwood Springs, Cak; Leadville, Col., one member each; Portsmouth, N. H., 2; Colorado Springs, Col., 3; and Pueblo, Col., 3. This with other individual accessions made a total of 112 new members for the year, making the grand total of membership 1,700.

Sanitary legislation which began to assume a definite practical shape with the advent of the National Association, was further advanced during the year, reaching cities and states where the intelligence and perseverence of master plumbers, actuated by the inspiring purposes of their association, had carried it. Their attention was little distracted from this labor by outside matters or affairs demanding time and consideration for their own protection. These few were speedily and satisfactorily settled by the President and Executive Committee, and from the slight disturbances greater harmony resulted.

The Executive Committee held four meetings during the year—first, at Pittsburg, June 28, 1889; the second at New York, January 14, 1890; the third, aboard the train in the State of Kansas, on June 16, 1890, and the fourth, in the Albany Hotel, Denver, Col., June 18, 1890. At the first meeting the sub-committees for the year were appointed. The Committee on Printing was directed to have the necessary printing done, which consisted of letter-heads, envelopes, etc.; also 2,000 copies of the proceedings of the seventh annual convention, for distribution. A committee was appointed to carry out the instructions of the seventh annual convention. The bonds of the Financial Secretary and Treasurer were ordered to be filed with the proper officers. The second meeting, at New York, was held at the Continental Hotel. At this meeting a large amount of business, necessary for the good of the association, was transacted. The reports of the Financial Secretary and Treasurer were read and approved. Reports from the Vice-Presidents for Kansas, Vermont, Indiana, Massachusetts, Iowa, Virginia, Ohio, Minnesota, Wisconsin and Pennsylvania were read, showing that the associations were vigorous and in healthy condition, and all were doing active work for the advancement of the interests of the plumbing trade. The matter of charges preferred against dealers for violations of their agreements were taken up, and in nearly every case satisfactorily settled. In one case, in the West, the committee was constrained to make special mention, as the firm charged proposed to have a committee of three appointed to investigate the charges, on condition that they pay all expenses if they did not exonerate themselves from all blame in the transaction complained of. The President appointed a committee which was acceptable to both parties, and, after a thorough investigation, the committee found the firm in question guilty, as charged. In this case the committee was unanimous. The cost of this investigation was large, as the committee was, by request, appointed from outside points. The President notified this firm of the committee's action, and furnished them a copy of their report, but they still appeared not to be satisfied, and declined to pay the bills of expense, whereupon the President entered into correspondence with them, and conducted it in such a dignified and business-like manner that the bill was paid in full and the case satisfactorily settled. There has also come to the committee's notice the fact that certain dealers were introducing the practice of issuing net price-lists of plumbing goods. This was severely condemned by the President. The usual committees on transportation were appointed to secure the best possible rates to Denver. The president of the Denver association was requested to have his association make the necessary arrangements for holding the convention, and to have the necessary printing done. Action was taken at this meeting requesting manufacturers and dealers to give better discounts, and that all discounts be trade secrets. The Financial Secretary was directed to call for the second half of the per capita tax March 1, 1890. The committee, after completing the business, visited all the prominent dealers and manufacturers in New York and urged them to make better discounts, and to make all discounts a trade secret, which they promised to do as far as possible. The business of the third and fourth meetings was of a routine nature. Among other things it was decided to recommend that all retiring presidents furnish their portraits to the incoming president, which, with all ex-presidents be published in the reports of conventions.

THE EIGHTH ANNUAL CONVENTION.

The Eighth Annual Convention was called to order in the Chamber of Commerce Hall, Denver, Col., by President Hannan at 2 o'clock P. M., Tuesday, June 17, 1889.

The Committee on Credentials reported present the following delegates:

Baltimore, Maryland—P. T. Barry, James Healy, Wm. Dunnett, Jno. Frasier, W. W. Rowles, Jos. C. Mitchell. Boston, Mass.—T. J. Tute, Wm. Lamb, Daniel G. Finnerty, Daniel Shannon, W. H. French, Henry W. Tombs, D. A. Hogan, Jos. H. Bagley, David Smith, J. F. Cronin, W. H. Mitchell, Wm. McKenna. Bridgeport, Conn.—H. B. Middlebrooks, Alfred Hopkins, L. H. Mills. Brooklyn, N. Y.—Geo. B. Lewis, Wm. Fallon, Geo. Cummings, H. H. Noble, T. W. Kelley, M. Lyons, Thos. Hudson, Wm. J. Fitzpatrick, Theo. Radcliffe, Jno. J. Keenan, Paul Ayres. Buffalo, N. Y.—L. J. Beyer, Chas. Geiger, Fred Yuhl, C. H. Carey, Jacob Mensch. Burlington, Iowa.—Henry Ewinger. Chicago, Ill.—H. Watt, R. Griffith, D. Whiteford, J. H. DeVeney, M. H. Reilley, C. J. Herbert, H. J. Killian, Wm. Bowden, J. H. Roche, J. R. Alcock, C. J. Byrne, C. C. Breyer, D. J. Rock, A. Young, T. F. Gay, J. J. Hamblin, J. G. Weber. Cincinnati, O.—Jno. A. Douglass, W. F. Wagner, Richard Murphy. Cleveland, O.—C. C. Dewstoe, W. A. Kelly, J. Schneeberger. Colorado Springs, Col.—E. S. Bunsted. Columbus, O.—E. A. Futurer, C. A. Klie. Decatur, Ill.—Philip Mueller. Des Moines, Ia.—Jos. Laing, Jno. Burnside. Duluth, Minn.—W. H. Dwyer. Glenwood Springs, Col.—Jos. A. J. Clowden. Indianapolis, Ind.—Jno. S. Farrell, Peter J. Gall. Kansas City, Mo.—L. B. Gross, Alex. Gray, H. B. Farley, D. M. Quay, R. B. Farley. Kansas State Association—Jos. Foley, S. J. Stewart, Thos. Lloyd, C. J. Prescott, R. Wood. Lowell, Mass.—Thos. Costillo. Leadville, Col.—C. M. Priddy. Minneapolis, Minn.—E. C. Cauvet, A. W. Scott. Milwaukee. Wis.—Chas. Polechek, W. E. Goodman, Herman Apell. Nebraska State Association—J. H. O'Neil, M. A. Free, N. B. Hussey. New York City—Jos. A. Macdonald, Geo. D. Scott, J. M. Knight, Wm. R. Bracken, H. G. Gabay, W. P. Austin, F. Sullivan, Jas. Gilroy, D. Mackay, Jr., T. J. Tourney, G. Fraser, T. J. Cummings, Frank Reynolds, Wm. Young, E. J. Brady, W. H. Quick, J. W. O'Brien, D. W. Littell, George B. Brown, Philip Smith. Philadelphia, Penn.—Jno. E. Eyanson, Wm. Harkniss, Jr., Enoch Remick, Wm. M. Wright, W. H. Doyle, F. P. Brown, J. J. Weaver, George F. Uber, A. G. Bond, Wm. McCoach. Portland, Oregon—T. J. Johnson, J. J. Owens, Alex. Muirhead. Pueblo, Col.—E. P. Fish, G. Geiser. Pittsburgh, Penn.—J. J. Kennedy, B. F. Call, James McGinness, Frank McKnight, Leo McShane, Allen McFadden, Geo. Sands. Rochester, New York—J. H. Howe, Wm. Barr, I. W. Ford, W. G. Reid. Sioux City, Ia.—D. W. Fitts, Jno. F. Gearen. Springfield, Mo.—W. W. Cronin, Harry Cooper. St. Louis, Mo.—F. Abel, J. Sheehan, Jos. Fennalty, Wm. H. Graham, Jos. P. Gallagher, David Roden, Thos. Cantwell, Samuel S. Dorley, Edw. P. Rearden, P. C. King, M. J. Ward, Jos. A. Stidger, Wm. Morris, Jas. A. Lynch. St. Paul, Minn.—J. J. Dunnigan, J. P. Adamson, P. W. Hudner. St. Joseph, Mo.—R. F. Connell, M. E. Herbert.—Syracuse, New York.—R. C. McClure, Ed. Jay, Alfred Tuilley. Salt Lake City, Utah.—J. J. Farrell, H. C. James. Denver, Col.—M. A. Dolan, W. H. McCarthy, W. T. Crean, Daniel F. Frey, W. F. McCarthy, Jos. Shannon. Lowell, Mass.—Thos. Costello. Bloomington, Ill.—Robert Loudon. Harrisburg, Penn.—Jno. A. Kramer.

Number of states represented 19; number of cities represented, 39; number of delegates as per credentials, 181.

Reports of vice-presidents were received from twenty states. The Financial Secretary reported receipts $3,138,50. The Treasurer reported receipts, $4,007.14; disbursements, $2,883.26. Article IV. of the Constitution was amended to read as follows: "The National Convention shall consist of representatives from local associations, one for every ten members, or fractional part thereof, where such associations exist, who shall be elected at or before the first meeting in May of each year, and the president of each association to be a member by virtue of his office. Article VIII. of the Constitution was stricken out. Article V. of the By-Laws was amended by striking out reference to the Auditing Committee. The following resolution was adopted: "That this national body appoint each association in the United States a Committee on Exhibition at the World's Fair at Chicago, in 1893; said committee to commence action at once; said associations in each state to be controlled by a chairman, who shall be appointed at this convention, and who shall direct the display, said chairman to be the state vice-president." The following resolution was referred to the incoming Executive Committee with power to act: "That the National Association recommend to the directors of the Columbian Exposition to be held in Chicago in 1893 the name of a member of this association for the position of sanitary superintendent.

The following officers were elected for the ensuing year: President, Robert Griffith; Vice-President, J. A. Macdonald; Recording Secretary, J. R. Alcock; Treasurer, M. J. Lyons; Financial Secretary, J. J. Hamblin. Executive Committee—Robert Griffith, J. A. Macdonald, J. R. Alcock, M. J. Lyons, J. J. Hamblin, E. J. Hannan, W. F. McCarthy, W. H. Mitchell, N. B. Hussey, W. G. Reid, L. B. Cross. State Vice-Presidents—Colorado, M. A. Dolan, of Denver; Connecticut, Lucius S. Mills, Bridgeport; District of Columbia, James Lockhead, Washington; Delaware, Isaac Eaton, Wilmington; Florida, Wm. Clark, Jacksonville; Illinois, David

Whiteford, Chicago; Indiana, James Madden, Ft. Wayne; Iowa, Wm. Ellomund, Sioux City; Kansas, Thomas Lloyd, Kansas City, Kan.; Kentucky, Simon Shulhafer, Louisville; Maryland, Wm. Drummett, Baltimore; Michigan, Ed. Sterner, Flint; Minnesota, S. H. Rothwell, Duluth; Missouri, David M. Gray, Kansas City; Maine, G. L. Learned, Waterville; Massachusetts, Daniel Shannon, Boston; Nebraska, Jas. H. O'Neil, Lincoln; New Jersey. W. F. Blacksham, Jersey City; New York, Martin Fallow, Brooklyn; Ohio, Richard Murphy, Cincinnati; Pennsylvania, B. F. Call, Pittsburg; Rhode Island, W. L. Whipple, Providence; South Carolina, R. L. Long, Charleston; Tennessee, T. J. Mooney, Nashville; Virginia, W. E. Foster, Norfolk; Vermont, B. F. Lyons, Montpelier; Wisconsin, E. T. Doyn, Milwaukee; Utah, Jas. Farrell, Salt Lake City; Oregon, J. J. Owens, Portland.

The following papers were presented:

"Inspection of Plumbing and House Drainage," J. J. Weaver, Philadelphia; "Best System of Preventing Back Water from Sewers Entering Buildings During Severe Rain Storms," J. J. Gallagher, St. Louis; "The Proper System of Controlling the Water Supply of Buildings in Cold Climates," J. J. Adamson, St. Paul; "Exhibition of Plumbing Material and Workmanship at the World's Fair in 1893—What Method can be Adopted to Make it an Attractive Feature and of General Benefit to the Plumbing Interests," J. J. Wade, Chicago. (This was a prize essay read before the Chicago Association May 22, 1890). "Traps and What is Known of Them as at Present used in the Plumbing Trade," David M. Quay, Kansas City.

Cincinnati having been selected for the next place of meeting the convention adjourned.

JUNE, 1890—JUNE, 1891.

While the year now drawing to a close and which will be completed June 25, 1891, has not finished its record, we have been enabled to gather some facts of much interest. The prime objects for which the association was founded had been so nearly accomplished, so well settled, and so harmonious had all the internal and external relations grown that a year of great growth was the result. The definite statistics relating to the progress made will not be compiled until the coming convention which will add its official reports to records not now made.

President Griffith early in his administration fully comprehended the existing state of things and set to work in conformity with the greatest needs and demands of the time. Trade protection had so surely demonstrated its beneficent relations to the manufacturers, the plumbers and the consumers that there existed no desire to attempt to undo the great work that had been done. The little disturbance that arose from this source was not sufficient to cause a ripple on the general peacefulness of the current of events which adds another year of progress to the history of the association. These few troubles were quickly and satisfactorily settled, and the present finds protection not only established as a principle, but applied as a practical rule of business.

The progress of all matters of sanitary import growing out of the work of the National Association has been little less than marvelous. Not only have the plumbers inspired one another with the importance of approved sanitary regulations, but city officials, state legislatures, boards of health, courts of law, and the general public have come to regard this matter of so much importance, that there will be scarcely a delegate at the convention who cannot report favorably regarding the sanitary relations of his locality. So liberal and broad has been the work accomplished that not only plumbing, but other sanitary agencies have received an impetus that fogyism, ignorance and prejudice could not stay it in its onward sweep. Plumbing regulations have been adopted in many cities this year, and a very general effort has been made in state legislatures establishing laws governing the trade. There has been more than double the work accomplished in this line this year than in any previous one. In this regard it has been a period of satisfactory progress.

The general condition of the association has greatly improved. The spirit of the National Association has extended to local associations, and their work has been more in harmony with its purposes, and the important lessons and principles of unification have been more deeply implanted. The effects of organization have been demonstrated and appreciated and its fruits have been more abundant. A general survey of the field is satisfactory.

President Griffith is drawing to the close of a very active year in the executive office to which the Eighth Annual Convention called him. His labors have been widely extended and his duties minutely discharged. The great object of growth and extension of organization early engaged his attention, and the records of the Ninth Annual Convention will record a year of progress of which the association can well feel proud.

ROBERT GRIFFITH, EIGHTH PRESIDENT N. A. M. P.

He began his labors in June, 1890, when he made a trip to St. Louis spending two days with the plumbers of that city whose guest he was during their excursion and picnic. In October he visited the states of Texas, Kansas, Missouri, Nebraska and Iowa, stopping at the cities of Dallas, Wichita, Topeka, Kansas City, St. Joseph, Lincoln, Omaha, Sioux City and Cedar Rapids. In December, as a delegate to the American Public Health Association, he visited Charleston, S. C. During the same month he entered the states of Georgia, South Carolina, Kentucky, Ohio and Tennessee, and visited the cities of Cincinnati, Chattanooga, Nashville, Atlanta, Charleston and Louisville. In January, 1891, he visited the states of Wisconsin, Ohio, Kentucky and Indiana, stopping at the cities of Milwaukee, Toledo, Cleveland, Columbus, Cincinnati, Louisville, Evansville and Indianapolis. In March he visited the states of Wisconsin and Minnesota, stopping at the cities of Milwaukee, La Crosse, St. Paul and Minneapolis. In May he visited Sioux City and attended the Iowa State Association of Master Plumbers. This wide range of territory covered indicates somewhat the extent of the labor performed, but does not include the correspondence or official duties that have received his careful attention throughout the year. The result of this labor has been the organization of from between fifteen and twenty new organizations which have been brought into affiliation with the National Association, and the organization of three or four other associations which may become so affiliated before the adjournment of the coming convention. The number of new members will range somewhat over 150. For the first time there will be represented through delegates at the convention the states of Texas, California, Montana and South Carolina. Many of these associations have been organized through President Griffith's personal efforts, and others through the labors of the executive committee and the state vice-presidents to whom credit is warmly given. All of the present year has been one of greater progress than any which have preceded it. The growth has been not only in the extension of organizations and the addition of membership, but in the general tone and health of the association. It has almost marked a new era in the upbuilding of the association, and has added materially to the growth and strength of an association

that has succeeded in the accomplishment of its purposes beyond the expectation even of its own members. When the convention completes the record of the year it will be seen that such progress has not characterized any previous year. The second year was an important and trying one in the history of the association; for in that year the great battle of protection was fought and substantially won. The association elected to stand or fall with this principle, and the test of its strength, the ordeal, the critical moment in its existence was upon it. With its ranks unbroken it marched to victory, and to-day every interest it touched is enjoying the fruits of its triumph. The present year has broadened the usefulness of the association and increased its value through an increase of the means and agencies through which it operates. Enlightenment upon the great sanitary needs of the day has been disseminated, ignorance has been combatted and a more healthful public sentiment created.

President Griffith is satisfied with his work, but feels that one year of sacrifices and labor is enough, and will cheerfully hand the sceptre of office to his successor and rest from his labors. His efforts have been intelligently directed and have been effectual. His record will hold a place of honor in the annals of the association, and the convention will close a year full of labor and gratifying results. We have in this another beautiful example of what can be accomplished in the demonstration of the justice of a principle. We have another lesson in the development of convictions in the triumph of right—another inspiring evidence of the world's recognition of those influences and agencies that touch the homes and happiness of men and make humanity purer and better.

PALPABLE RESULTS.

The foregoing history is necessarily brief and unavoidably imperfect. The object has been not so much to record facts as to develop truths; not so much to chronicle events as to interpret their philosophy. Whatever motives may have been ascribed to the master plumbers in the formation of this association, or whatever actuating desire may have been attributed to them in the masterly direction of its course, its history demonstrates the fact that in every phase of its existence, in every consideration and development of its purposes, it has benefited the public immeasurably more than it has its own members. Trade protection, denounced at first as fanaticism, extortion, and communism, has been the great central force which brought plumbing out of its chaotic state of uncertain good into harmony and conformity with best hygienic laws and made of its high offices public benefactions. Protection has given the public security from the evils of incompetent workmanship, and assured it against the dangers of poor material. It has reached out to the cities and towns of every state in the Union, elevated the profession, created a new public sentiment, educated the public mind, established just and legal means by which approved plumbing may be secured, placed upon our statutes a penal code in the interest of domestic and public health, and brought to every man's door the easy possibility of securing healthful homes through the agency of plumbing governed by law and established under rules and regulations in conformity with the latest and best requirements of household and public sanitation. It has made of laborers and tinkers skilled mechanics; of plumbers in dingy basements it has made merchants in spacious and cleanly rooms, and of all it has made sanitarians whose experience and practical scientific knowledge have been found invaluable in the counsels of health departments and in the advancement of hygienic laws which have inaugurated a revolution in the customs, observances and regulations of modern life. It has benefited the manufacturer and dealer, thrown wide open the doors to research, experiment and discovery, and has revealed a limitless field for the exercise of inventive genius.

The efforts made and influence exerted by the association for the advancement of the plumber and the promotion of sanitary interests, were alike successful. There is not a state or territory in this country to day that has not experienced a marked progress, not only in the perfection of plumbing and plumbing supplies, but in the advancement of public sanitation, the promotion of hygienic intelligence, and a broader and more practical and scientific knowledge of right living. Legislation, seeking to forward these great purposes, has found favor and expression in our legislatures, the halls of Congress, and have received the distinguished consideration and approval of the Chief Executive of the Nation.

We have not touched upon the social features of the association which is found in the enunciation of principles on which it was founded. The object has been to trace out the purposes and aims of the association in relation to public welfare. But in this the social feature is not without value. It has strengthened the bonds of fraternal relations, incited friendly rivalry and inspired honorable emulation. The grand banquets annually held have had their influence in strengthening and promoting the greater objects for which the association was projected. The banqueting halls have been not only scenes of gaiety and pleasures, of music, feasting and enjoyment, but intellectual focci, from which have radiated wisdom which is found to-day in our code of laws and in an enlarged and enriched literature of sanitary science. It can be said that with the advent of the National Association there originated a new literature, opening a new field for the press, adding a new feature to our great magazines and filling a new department in our public prints. Ten years ago a satisfactory treatise on sanitary science could not be found. Man can surround himself to-day with a complete sanitary library and place upon his table special periodicals devoted to the varied interests of this the most important of all the sciences. Schools have been endowed for special instruction in this branch, sermons are preached on it, courts have rendered decisions regarding it, and it has become an important part of our great national history. In the brief history here outlined these wonderful truths are traced, in the contemplation of which one must observe that, in the words of their motto, verily, "They builded better than they knew."

SOME REFLECTIONS.

One cannot contemplate the public benefits that have resulted from this association without enquiring, where has the condition of the plumber been improved, and his business interests enhanced? The commercial feature, one of the bases of the association, has not received that attention on which it is due the plumber to bestow. The endeavors put forth in other directions have accomplished the objects sought, as we have seen, and is it now not time that some consideration should be given more directly to the promotion of business interests? The association with its numerous local organizations and members should direct some worthy and definite effort toward the financial interests of the craft, in order that the advantages due from organization should be more fully realized. Out of the collected wisdom and experience of such an association as this, some principle, some custom or practice should be developed, the operation of which would tend to secure to the plumber some just remuneration for his skilled and important labor. There is, of course, no law or rule which can take the place of industry and business capacity; but there can be established rules of practice which will secure to this industry and capacity a just recompense. Among the first necessities in this regard is an immediate demand for closer organization, a greater, more effective and more scrutinizing watchfulness of the plumbers' interest. If this must mean a stricter dicipline in the trade, so let it be. The relation of the plumber to the public is of public concern, but his business belongs to himself and in relation to that his lips should be sealed. Transactions in executive sessions, or in any other sessions, concerning the business interests of the plumber need not be borne to the public ear on the following morning's breeze. The plumber's business is the business of the plumber; his contracts, expenditures and profits are important business secrets to all who would prosper. The only competitor in the plumbing trade is the plumber. He can make competition ruinous or he can make it healthful. He can make his income less than his outgo, or vice versa. There is just so much plumbing work to be done. Ruinous prices will not increase this amount nor will a fair profit decrease it. Prosperity or poverty is in the plumbers hand. The regulation of these affairs is under their control. They are masters of the situation, and organization close enough to induce or compel the plumber to be just to himself and loyal to the fraternity is one of the immediate demands of to-day.

The following are the present officers of the Cincinnati Plumbers' Assoctation: President, Thomas Gibson; Vice-President, Thomas McNeil; Treasurer, James A. Gibson; Secretary, Frank Hipple.

NEW HAVEN ASSOCIATION OF MASTER PLUMBERS.

To the Master Plumbers Association of New Haven.—GENTLEMEN: Pursuant to that provision of our constitution which requires your presiding officer to report in writing at each annual meeting, concerning the doings of the association during the year immediately preceding, I desire to submit to your kindly consideration, this evening, a few words stating briefly what we have done within the past twelve months and what our condition is at the present time. Before doing so, however, permit me to say by way of preface, something in reference to the work in which we are all engaged, and to the study and investigation of which we as an association may very properly devote a reasonable proportion of our time.

Within the business life of many of us, and certainly within the memory of us all, the subject of sanitary science has become one of great importance, or at least has come to be so regarded. It concerns not only ourselves as practical men, but the public as well, whose health and comfort are so largely entrusted to our keeping. This importance has come to be more and more realized with the flight of years as our city has grown. With this growth there have developed demands for pure air and pure water, and a necessity for a large and adequate sewerage system. And so as the years go on these demands will increase, and the subject of sanitary science will require more and more our attention. Without countenancing all the theories which have been advanced as a remedy for the ills of improper sanitary arrangements, I may safely say, that much still needs to be done in addition to that already accomplished before the subject will be thoroughly mastered.

Plumbing and drainage, which a few years ago were luxuries, to be enjoyed by the well-to-do, are now regarded as necessaries and may be found in well-nigh every house, whether it be a six-family tenement or a costly residence. However little the people at large may regard them, they are most intimately associated with public health and life.

The keeping of our persons, our houses and our streets clean is committed largely to our care, and whatever we may do towards the advancement of these ends demands, and I believe will receive, public commendation and support. Let us see to it that by the character and thoroughness of our work we deserve it. That we get very little credit in any particular case for our ingenuity, or little reward for our experience and skill; that our abilities are overlooked and our patience overtaxed, is no just reason why we should relax our efforts.

The objects which we have in hand should be more to us than the putting of a few dollars into our pockets, or the saving of a little time. They should be to us a matter of public welfare, and we should ever impress upon the public mind the importance of our mission, and that our business is one requiring care and ability of more than an ordinary kind. This association, with this in view, would thus become a factor of no mean importance and would find in this alone, if for no other reason, ample cause for its existence and perpetuation. We should thus become an essential organization and find a work to do worthy of our highest endeavor.

Turning now to the inner life of our association, I feel that I am justified in saying that we have had many things to encourage us and mark the year as a bright and successful one. Many new names have been added to our roll, and with the inspiration which increasing numbers give and the new energy which they bring have come renewed and more persevering efforts. It is a cause of much gratification that we find among our members such a large proportion of the master plumbers of our growing city. Upon us all devolves the duty of preserving our organization and of enhancing its usefulness both to its members and to the public. This association, gentlemen, will be just what its members make it and in proportion to their interest and zeal will be its success. It is no place for petty jealousies or personal animosities. Confidence in each other is as essential here as in any other walk in life, and how much in the world at large depends upon man's confidence in man!

Among the more important matters which have received our attention have been the ratification and renewal of an old agreement with the journeymen's association relating to the hours of labor in the winter months. This contract should have been, and I believe was, faithfully kept.

The proposed city ordinances relating to plumbing, commonly called "The Plumbing Ordinances," and providing for a more careful and thorough supervision by a public officer of all drainage and sewerage in houses, factories or elsewhere, have also received some attention at our hands. These ordinances have been reported favorably by the committee to whom they were sent for consideration and are now waiting for the approval of the Court of Common Council. I regard them as desirable and believe that they will promote the objects for which they were intended. Further than this, as an officer of this association, I would not commit you, as our motives might be questioned perhaps and as it is better that we should not be too active in securing their passage, however much we may deem them desirable or necessary. (Since this report was made these ordinances have been passed by the City Council.)

I cannot refrain from saying a word about our National Association. It is doing a good work and needs your encouragement and support. A gathering of men, representing the master plumber throughout the country, all engaged in the same pursuit, though under different conditions and in different localities, is bound to have an educating influence upon all who come into contact with it.

The last annual convention of the National Association met in June, 1890, at Denver. Nineteen states and thirty-seven cities were represented by one hundred and eighty-one delegates sent by local associations from all parts of the country. These meetings are full of interest and instruction. The reports and papers upon a large variety of subjects relating to the trade which are prepared with great care for the occasion, with the discussions which they arouse are valuable and timely. The opportunities for conference and inquiry are many, and the good will and friendship engendered between the different sections of the country, by the inter-mingling of their several representatives, all conduce to the cementing of our associations together and establishing a spirit of harmony and strength.

The next annual convention will be held at Cincinnati, June 23, and promises to be as fully attended and as beneficial in its results as any of its predecessors. I trust that the Connecticut associations will contribute their share towards its success and support, and suffer our good old commonwealth to lose none of the glory which to her belongs by reason of her long and patient labors in the interest of art, manufacturing and mechanics.

In conclusion, gentlemen, I wish to thank you for the courtesy which you have shown me as your presiding officer, and to express my sincere hope that the association stands upon the threshold of a long and ever-increasing prosperity.

New Haven Association. S. E. DIBBLE, Pres.

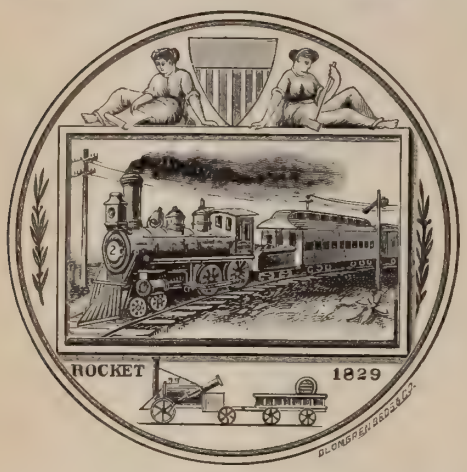
The officers and committees elected by the New Haven Association for the present year are: President, S. E. Dibble; First Vice-President, John D. Eldridge; Second Vice-President, F. A. Carlton; Recording Secretary, Andrew J. Clerkin; Corresponding Secretary, Noble P. Bishop; Treasurer, Wm. Keane; Sergeant-at-arms, J. H. Buckley. Executive Committee—S. E. Dibble, John D. Eldridge, F. A. Curtis, A. J. Clerkin, Jas. M. English, J. H. Buckley. Sanitary Committee—Robert Morgan, Wm. Keane, James M. English. Arbitration Committee—S. E. Dibble, N. P. Bishop, F. A. Curtis. Auditing Committee—John D. Eldridge. L. W. Corbett, Thos, J. Groark. License Committee—T. W. Corbett, Robert Morgan, Thomas Gunning. Legislative Committee—A. J. Clerkin, John D. Eldridge, Jos. Shearlock. Apprenticeship Committee—J. H. Buckley, F. A. Carlton, E. T. Pierpont. Conference Committee—Wm. Keane, J. R. Garlock, J. H. Buckley.

The National Association of Master Plumbers have settled one thing beyond dispute: Whatever object they have pursued, or whatever purpose they have accomplished, the results have been of direct benefit to the public. Every act in its whole history has had a salutary effect on the public welfare.

If the plumber places a low price on his work, it will be but natural and reasonable for the public to do the same. It is very seldom that a man is estimated at more than the estimate he places on himself.

J. Franklin McElwee, plumber of Welmington, Del., took unto himself a wife last week.

Durham . System . of . House . Drainage.



Silver Medal Awarded in 1883 to the Durham House Drainage Company, of Chicago.

E. BAGGOT, Chicago.

OFFICE & SALESROOMS: 169 & 171 Adams Street.
BRANCH: 2134 Michigan Avenue, - - -
FACTORY: 367 & 369 Illinois Street, - -

P. V. Dwyer & Bro., St. Paul.

Durham Sanitary Engineering and Construction Co., Minneapolis, Minn.

Hussey & Day Co., Omaha, Neb.
Henry Paul, Houghton, Mich.
J. D. Madden, Fort Wayne, Ind.
J. M. Toye, Winona, Minn.

Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C.**

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

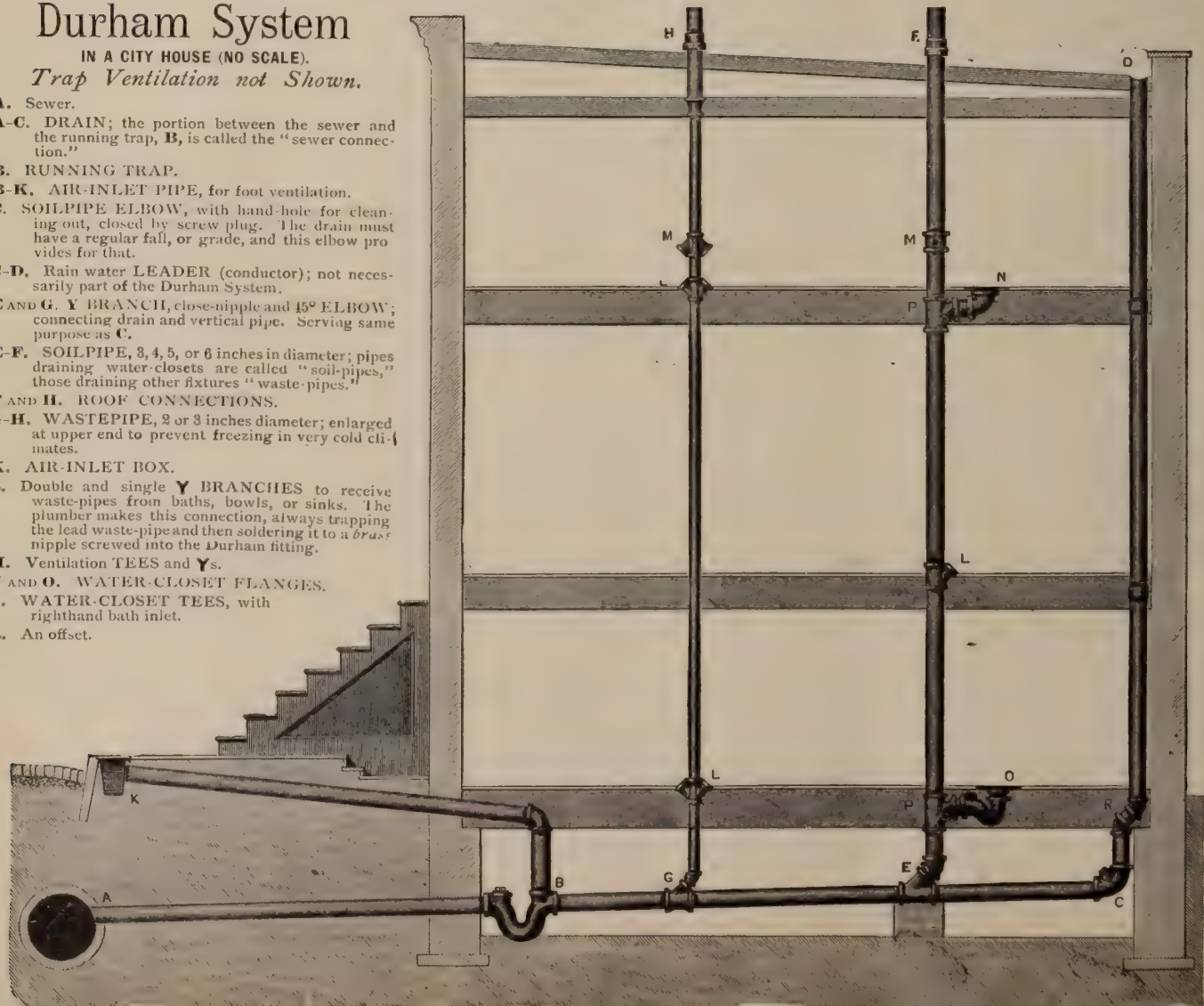
L. Double and single Y BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and Ys.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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The thanks of the trade press are due President Griffith and Secretary Alcock for their courtesy and great aid which they gave the press. We make this public acknowledgement as being not only due to efficient and able officers, but to courteous and accommodating gentlemen.

The social features of the convention will be given next week. They are an important part of the proceedings and deserve to be of record. They may not relate directly to the business of the convention, but they tend to unite more strongly the bonds of friendship and good will so characteristic of the plumbing fraternity. The general good feeling and cordiality manifested at all times evidence the fact that fellowship in this association means something. The fraternal spirit was observable at all times, and the great benefit and helpfulness of these meetings are not to be slightly considered. The convention demonstrated the fact that the association is a fraternity in which the good will of fellowship is extended to all. It is worth something to note the value of this most pleasing feature.

It is probably fitting to remark that, at this prosperous period in the life of the National Association, it is the duty of each local association, officer, committee and individual to press forward the work in extending the usefulness of the association. There is now nothing of consequence left to fight. Public sentiment has been brought into harmony with the great purposes of the association, for it has learned what the great underlying principles are. Wherever the purposes and good work of the association are known there are none left to oppose it. But this should not tend to lessen the efforts of master plumbers. Their own prosperity is a subject which may now properly claim due consideration, and we trust efforts in this direction may prove as successful as were the efforts of the association in serving the public good. Master plumbers have made sacrifices freely, have given of their time, money and labor unsparingly to further the wellbeing of humanity, and may they not now receive the reward they have so justly earned?

The Sanitary News wishes to return thanks for the many kindnesses and courtesies extended to it by the officers and members of the Association and the hearty welcome given it. We appreciate all these most heartily, and will put forth our best efforts to give the plumbers of this country a representative, first-class journal.

President Griffith was a gentlemanly and prompt presiding officer, and he can retire from his labors with the consciousness of his administration having been the most prosperous of any preceding year.

The convention went down between the sessions on Wednesday and had its picture taken. The artist, Mr. J. Landy, 208 West Fourth street, Cincinnati, got an excellent picture, and copies can be had at the rate of $3 per copy, on application to the above address. There are over 300 persons in the group, and the faces can be distinctly recognized. The picture is twenty-two inches long, handsomely mounted with title, etc.

It will be seen that a portion of the report of the convention will have to be deferred till next issue. There was a great amount of business transacted, and we deem it better to continue the report next week than cut it down to the space devoted to it this week. A report will be found full enough in The Sanitary News to replace the official report should it by any chance get lost. Every plumber will want to keep a report of the preceedings and for this reason the report is made as complete as it is. It will be found good reading all through and much of it will be found useful for reference.

The most excellent papers read at this convention will appear in future issues of this journal.

The Cincinnati Association has demonstrated the fact that it knows how to entertain, and that it is not backward in doing it.

The Association is to be congratulated on the election of J. A. Macdonald as president and Jeremiah Sheehan as vice-president.

THE NINTH ANNUAL CONVENTION OF THE MASTER PLUMBERS OF THE UNITED STATES.

[Held at Cincinnati, June 23, 24 and 25, 1891.]

TUESDAY MORNING SESSION.

The Ninth Annual Convention of the National Association of Master Plumbers assembled at the Scottish Rite Cathedral, Cincinnati, Ohio, June 23, 1891. The procession formed in front of the Gibson House, and headed by the band marched 300 strong to the cathedral, where a hall had been beautifully decorated and appointed for their reception. Before order was called Mr. Hussey, of Omaha, Neb., called for three cheers for the Master Plumbers Association, which were given heartily, the convention standing. Three rousing cheers were then given for President Griffith, who had just appeared on the stage. The convention was called to order by President Griffith at 10:25, and Mr. Thomas Gibson, President of the Cincinnati Association, was introduced, who welcomed the delegates and visiting members of the association as follows:

Mr. President and gentlemen of the National Plumbers' Association.

It gives me great pleasure to see so many delegates assembled here this morning to deliberate upon the momentous sanitary questions of the day. Cincinnati is noted for the rapid strides it has made in developing and extending the plumbers' profession.

In 1839, when I first came to Cincinnati from St. Louis, to enter upon my apprenticeship, very few people knew what a plumber was, but since that time, even if not personally acquainted with a plumber, every one, by means of the alleged newspaper humorists, knows them by the size of their bills.

There was a country church in Scotland whose minister was absent. The promised supply failed to put in his appearance, and as many of the members came from quite a distance, one of the elders undertook to conduct the service. He did very well in giving out the Psalms, in prayer, and in reading the chapter of scripture, which was in the book of Job, when he said: "My freens, I dinna ken what you think about this subject, but it's my candid opinion that atwixt God and the devil Job was a very ill-used man."

I sometimes think that plumbers resemble Job in more ways than one. Every branch of the building trades is important; and pre-eminent among them all stands plumbing, contributing as it does to the comfort and health of the people at large.

Physicians from all over the land hold their conventions and discuss matters pertaining to the advancement of their profession —the cure of diseases which have taken hold of man; and we commend them for it. Our business is to prevent these diseases the physicians cure, and certainly our deliberations must be of more importance and moment than theirs. For "an ounce of prevention is worth a pound of cure."

The plumbers' business is becoming of more importance to the people at large every day. As property rises in value, the owners are enabled to occupy the whole of their lots with buildings, owing to the great improvements in sanitary plumbing. It is in consequence of the advancements in our trade more than the progress made by other trades, that the erection of large and lofty buildings in our great cities is possible. Old London was but two stories high. You all have witnessed the wonders of our modern times.

The Cincinnati Master Plumbers' Association welcomes you to the Queen City of the West, and desires me to assure you that ample preparations have been made for your comfort and pleasure while attending this convention. We hope that you will enjoy yourselves so well, and depart so much pleased with our city, that you will desire to come again.

With the earnest hope that all things may combine to make this meeting, in our fair city, a most pleasant one, I say, welcome to one and all.

Mr. Gibson's address was loudly cheered, at the close of which he introduced Mayor Mosby, who in substance said:

Gentlemen of the Convention:

It is a duty I owe to the master plumbers of this city and to the citizens to give you welcome. We are proud of our city and proud of our plumbers and their bills. The master plumbers will extend to you our city's hospitality, and I extend to you the freedom of our city. You will be taken care of in a manner due the important interests you represent. I am not a plumber and do not know anything about your "take-ins" and your "wash-outs." That is not my trade; but I suppose your "take-in" is the man whom you do plumbing for, and your "wash-out" represents the condition of his pocket book after he has paid the bill. A few years ago plumbing was a mere trade and uncertain in its service, but now it is advanced to a science requiring not only mechanical skill, but scientific knowledge. As I said I am not a plumber, and do not want to get into your domain or I will get lost. I recognize the importance of your high calling and its relation to public comfort and health. I want you to see our city. You will be taken to our places of interest, and don't fail to see our suburbs for we have the finest on God's green earth. Gentlemen, I give you the freedom of our city.

Great applause and three cheers followed the conclusion of the Mayor's address.

President Griffith referring to the address said he could assure the Honorable Mayor that he would not be taken in by the plumbers present and that he would not find his pocket book washed out. He also hoped that as the Mayor had extended to them the freedom of the city none of the plumbers would get pulled in.

"This gavel," said the President, "will bear interpretation. The handle is made of a piece of wood taken from the South Fork dam which caused the disaster at Johnstown. It signifies caution, wisdom and prudence; that force is often destructive where gentler measures would be the means of accomplishing much good. There are subjects coming up for our consideration in which we must use wisdom and prudence and not the destructive element of force. The flood at Johnstown did no good, but a vast amount of harm. It destroyed and nearly depopulated a city, and flowed on out into the sea, and was lost and forgotten except in the sad remembrances it left behind. Let us be not like the flood that sweeps everything in its path to destruction, but like the gentler tide that flows through our plains and villages giving health and strength to all about it. The head of the gavel came from the top of Pike's Peak, indicating that our aims should be high and our motives and purposes lofty. We are engaged in a high calling, and our motto should be onward and upward to the summit of our profession. There is also a signification in the source whence the gavel came. I want to use it with caution, prudence, wisdom and gentleness, on account of the source from which it came, for it was presented to me by the Ladies' Auxillary Association at Chicago." This speech was greeted with cheers and long applause.

President Griffith then appointed the Committee on Credentials, consisting of Messrs. J. J. Wade, of Chicago; Wm. J. Fitzpatrick, of Brooklyn; Henry W. Tombs, of Boston; Wm. M. McCoach, of Philadelphia; and James Gillroy of New York.

On motion of Mr. Andrew Young the convention adjourned till 2 o'clock.

TUESDAY AFTERNOON SESSION.

The convention assembled at a quarter past 2 o'clock, when President Griffith announced that the Committee on Credentials had not yet finished their report, and it was not till 4 o'clock that the gavel fell for order.

The Credential Committee reported through the Chairman, J. J. Wade of Chicago, and the report was read by the Secretary of the Committee, Mr. W. M. McCoach of Philadelphia. The report, after considerable discussion and corrections was adopted as follows:

REPORT OF CREDENTIALS COMMITTEE.

Cincinnati, Ohio, June 23rd, 1891.

To the President, Officers and Members of the National Association of Master Plumbers of the U. S.

Gentlemen: Your Committee on Credentials would most respectfully make the following report: From the credentials presented and compared with the books of the National Financial Secretary we find the following entitled to seats in this convention.

Total number of delegates, 239.

Respectfully submitted:

J. J. Wade.
W. McCoach,
Henry W. Tombs,
James Gillroy,
Wm. J. Fitzpatrick, Committee.

Altoona, Pa	3	Los Angeles, Cal.	4
Baltimore	7	Madison, Ind.	1
Buffalo	3	Louisville	4
Brooklyn	27	Covington	2
Burlington, Iowa	1	St. Joseph	2
Bloomington, Ill.	1	St. Louis	15
Boston	11	St. Paul	2
Cincinnati	7	Sioux City	1
Chicago	14	Springfield Mass	1
Chattanooga, Ill.	3	Texas State	5
Cleveland	3	Washington, D. C.	5
Duluth	1	Worcester, Mass.	2
Dayton, O.	2	Rochester, N. Y.	5
Davenport, Iowa	1	New York City	26
Evansville, Ind.	2	Parkersburg	2
Fort Wayne	1	Hamilton, O.	1
Indianapolis	3	Pueblo, Cal.	2
Kansas City	4	Portland, Ore.	3
Kansas State	5	Philadelphia	7
Milwaukee	5	Pittsburg	12
Nashville	2	Vincennes, Ind.	1
New Haven	2	Denver	6
Nebraska State	2	Bridgeport	2
Seattle	4	Charleston, S. C.	3
Salt Lake City	3	Toledo, O.	1
Columbus, O	2	Oil City, Pa.	2
Syracuse	3		

Altoona, Pa.—G. M. Stewart, president; David Wylie, Charles Wylie.

Baltimore, Md.—Joseph Mitchell, president; John Trainor, W. H. Rothrock, Geo. Knipp, D. J. Barry, V. H. Dunnett, D. N. Sullivan.

Buffalo, N. Y.—Charles Geiger, president; L. P. Beyer, J. S. Stygall, Jr.

Brooklyn, N. Y.—Wm. J. Fitzpatrick, president; W. J. Gault, M. J. Lyons, Geo. Cummings, Thos. H. Radcliffe, Geo. B. Lewis, Martin Fallon, H. M. Noble. Thos. H. McWhiney, John Danaher, Geo. Alfred Smith, Gos. Zoll, Thos. Donivan. John J. Keenan, W. E. Morgan, Patrick Dunn, Paul Gateson, O. O. Sawkins, W. Keegan, J. W. Kelly, J. M. McConnell, W. J. McCaw, W. J. Roche, R. J. Knox, E. McDonald, O. Marrin, M. J. Farrell.

Burlington, Iowa.—H. Ewinger.

Bloomington, Ill.—Robt. Loudon.

Boston and vicinity.—Thos. J. Tute, president; Danl. J. Shannon, W. H. Mitchell, W. U. McKenna, H. W. Tombs, J. W. French, C. W. Bromwich, D. A. Horgan, D. J. Finnerty, J. P. Conlon, Geo. C. Forbes.

Cincinnati, Ohio.—Thos. Gibson, president; C. W. Murray, Thos. McNeil, J. R. Gibson, E. J. Nolan, W. J. Gibson, Fred. Lampkin.

Chicago, Ill.—J. J. Wade, chairman; D. J. Rock, T. C. Boyd, T. P. Culloton, M. L. Mandbale, A. Young, Paul Redske, W. Bowden, J. Weber, P. Sanders, J. Matthews, C. Byrnes, Thos. Kelly, J. J. Clark.

Chattanooga, Tenn.—J. J. Mack, president; Fred Fox, Jr., R. Whigham.

Cleveland, Ohio.—Adam Schneider, president; W. H. Henderson, W. A. Kelly.

Duluth, Minn.—W. W. Hooper.

Davenport, Iowa.—James Cameron.

Dayton, O.—Charles Ware, F. J. McCormick.

Evansville, Indiana.—Alex. Crawford, president; Chas. Wamsdell.

Fort Wayne, Indiana.—James Madden.

Indianapolis, Indiana.—Chas. Aneshensell, president; P. J. Gaul, Jas. Healey.

Kansas City, Mo.—L. B. Cross, president; H. B. Farley, W. G. Ashdown, Alex. Gray.

Kansas State.—C. J. Prescott, president; A. T. Buckridge, John Sheehan, Jas. Foley, Robt. Mood.

Milwaukee, Wis.—P. H. Murphy, president; L. H. Plum, W. E. Goodman, L. Eggert, Charles Polachek.

Nashville, Tenn.—David Glemar, president; J. L. Park.

New Haven, Conn.—S. E. Dibble, president; A. J. Clerkin.

Nebraska State.—J. H. O'Neill, president; N. B. Hussey.

Seattle, Washington.—D. B. Spellman, president; W. B. French, Thos. Kearns, J. S. McLellan.

Oil City, Pa.—Ray S. Clarke, president; Wm. Moran.

New York City, N. Y.—H. G. Gabay, president; Geo. D. Scott, John Byrns, Jos. A. Macdonald, J. N. Knight, Frank Reynolds, Wm. H. Quick, T. J. Toumey, T. J. Cummins, J. S. Dunn, C. H. Kranichfelt, T. Sullivan, M. J. McDermott, E. J. Brady, Jos. O'Brien, J. Gileroy, T. J. McCormack, Philip Smith, D. W. Littell, John Miller, O. McGinness, E. J. Connor, John MCarron, J. A. Rossman, Charles Tucker, Wm. Young.

Rochester, N. Y.—W. G. Reid, president; George Hennegan, John A. Creelman, Jas. J. Connor, Jas. A. Tanner.

Parkersburg, W. Va.—Chas. H. Turner, president; Wm. S. Caswell.

Hamilton, Ohio.—J. L. Walker.

Pueb'o, Col.—J. I. Morgan, president; J. H. Bennett.

Portland, Ore.—Alex. Muirhead, president; A. Donnersberg, Robt. Brady.

Philadelphia, Pa.—Wm. Harkness, Wm. M. Coach, E. Remick, Frank P. Brown, John J. Weaver, Geo. F. Uber, John E. Evanson.

St. Joseph, Mo.—J. W. Powers, president; R. T. Connell.

St. Louis, Mo.—Jos. P. Gallagher, president; James Lancaster, J. M. Lipe, Jos. Tumulty, P. H. Callahan, D. J. Collins, J. F. Reardon, M. J. Ward, Wm. Morris, Jeremiah Sheehan, Jno. McMahon, O. J. Gerhardt, Patrick Madden, E. P. Reardon, Wm. Schwehr.

St. Paul, Minn.—W. J. Freaney, J. T. Holmes.

Sioux City, Iowa.—J. A. Harris, president.

Springfield, Mass.—J. W. Kennealy, president.

The Texas State.—F. J. Madden, president; A. H. Shafer, Geo. Mummert, D. J. May, D. F. Sullivan.

Washington, D. C.—James Ragan, president; E. J. Hannan, D. S. William, son, J. I. Atchison, E. F. Brooks.

Worcester, Mass.—John J. Jordan, president; J. F. Deedy.

Salt Lake City, Utah.—J. J. Farrell, president; H. S. James, B. M. Ellenbeck.

Columbus, Ohio.—D. H. Kelly, president; E. A. Futerer.

Syracuse, N. Y.—W. N. Tobin, president; Chas. G. Hanchett, M. J. Kennedy.

Los Angeles, Cal.—S. M. Perry, president; H. A. Bennett, W. C. Furry, J. C. McMenomy.

Pittsburg, Pa.—Allen McFadden, president; F. P. Blythe, John M. Tate-James G. Weldon, I. R. Becker, James Hay, John Cowley, B. F. Coll, S. W. Hare, J. J. Kennedy, R. J. Bradshaw, Geo. Addy.

Vincennes, Ind.—C. F. Munroe.

Madison, Ind.—A. Anger.

Louisville, Ky.—M. J. Duffy, president; Simon Shulhafer, John Stickler, W. H. Matlack.

Covington, Ky.—W. S. Nock, J. T. Underhill.

Denver, Col.—Jos. P. Ratican, Wm. McKelvey, M. McIntyre, T. J. Delaney, Archie Davis, John R. Parry.

Bridgeport, Conn.—Gerhardt Drouve, Thomas E. Logan.

Charleston, S. C.—W. P. Padden, president; J. A. Reilly, O. S. Miscally.

The President appointed David J. Collins, of St. Louis, Sergeant-at-Arms. The following Committee on Resolutions was appointed by the president: W. H. Rothrock, of Baltimore; T. C. Boyd, of Chicago; W. J. Freaney, of St. Paul; James J. Weldon, of Pittsburg; Daniel Shannon, of Boston. Communications were read from James Allison, inviting the delegates and vistors to visit the House of Refuge and the Mechanics Institute; the Secretary of the Builders Exchange extended the freedom of the Exchange to the plumbers. A like communication was received from the Chamber of Commerce. Communications were also read from the Master Plumbers' Association of Boston, Mass., Providence, R. I., and Los Angeles, Cal. The following communication, which was loudly applauded, was read from Dr. DeWolf, of Chicago:

CHICAGO, June 18, 1891.—*Robert Griffith, President of the National Association M. P. A.—Dear Sir*: If I may judge from my own observation during the past fifteen years, I am justified in saying that no feature of sanitary science, or the application of scientific thought to the sanitary necessities of civilized communities, has passed along to so remarkable a development as that branch of the sanitary tree which your organization represents. By intelligent and logical methods you have advanced from the mere mechanic to a commanding position in sanitary science, and the scientific world recognizes and ackowledges your claim.

No curriculum of medical study is now complete which does not take note of your work, and for the past three years I have sought to supplement my course of lectures on public hygiene at the Chicago Medical College by several lectures on plumbing and plumbing appliances given by a distinguished ex-president of the National Master Plumbers' Association.

In view of my interest in this subject, you will not regard it as improper, I trust, if I suggest the propriety of your appointing a committee to wait upon the Director General of the Columbian Exposition to present the name of some fellow of your organization as Chief of the Bureau of Plumbing Exposition. This exposition *should* be made—as it *can* be made—of world-wide interest, and will be a subdivision of the general division of "The Liberal Arts." A place is provided for you—and you should fill it. With congratulations, I am,

Very respectfully yours,

OSCAR C. DEWOLF, M. D.

The following Auditing Committee was elected by the Secretary of the convention casting the vote of the convention for each member: J. Sheehan, St. Louis; Geo. Cummings, Brooklyn; Chas. Polachek, Milwaukee. Resolutions were offered by J. J. Wade and Matthew Mandable of Chicago, which were read and referred to the Committee on Resolutions to report on at some future time. The chairman of the different delegations were called and badges for the delegates were handed out. The convention adjourned till 9 o'clock Wednesday morning.

WEDNESDAY MORNING SESSION.

The convention was called to order at 9:45 by President Griffith. The roll call showed 107 delegates present. On call for resolutions the Pittsburg Association submitted a series of resolutions relating to the regulation of the sale of gas and electric light fixtures; resolutions were presented by J. J. Wade and T. C. Culloton of Chicago, all of which were referred to the Committee on Resolutions. Under call of amendments M. J. Lyons of Brooklyn offered amendments to two sections of the constitution; referred. On call for reports of select committees,

President Griffith presented his report as delegate to the American Public Health Association at Charleston, S. C., December 16, 1890, which is as follows:

PRESIDENT ROBERT GRIFFITH'S REPORT.

(Report of Delegate to American Public Health Meeting, Charleston, S. C., December 16, 17, 18 and 19, 1890.)

CINCINNATI, OHIO, June 23, 1891.

To the National Association of Master Plumbers of United States of America.

GENTLEMEN:—As your representative to a meeting of the American Public Health Association held in Hiberian Hall, in the City of Charleston, S. C., December 16, 17, 18 and 19, A. D. 1890, I beg leave to submit to you my report as follows: As Mr. Andrew Young has an Essay on the Objects of the American Public Health Association, I will simply bring to your notice some of the business transactions.

Owing to some delays on the road which prevented me from reaching Charleston in time for the opening of the meeting, I am unable to state to you just what transpired during the first two hours, but learned that nothing of importance was done.

On my arrival at the hall where the meeting was being held, I at once made myself known and applied for admission as the representative of the National Association of Master Plumbers of United States. Upon payment of five dollars, my name was submitted to the meeting and I was elected a member of the American Public Health Association and welcomed as your representative.

Upon entering the hall my attention was attracted by the appearance of the gentlemen present; in many respects they resembled those who compose our convention here to-day. There was the old man with white locks; the middle aged mixed with gray, and the young men, who appeared to be just starting in life; all interested in the health of the people of this great country, as we are, who are assembled here to-day for the same purpose and realizing the importance of good healthy habitations, which contributes largely to the happiness of our people, had left their homes and business at a great sacrifice to many of them and traveled a long distance in order to attend that meeting, for the purpose of giving their experience and in return receiving the experience of others.

On the evening of the 16th, a meeting was held at the Grand Opera House, where addresses of welcome were made by Hon. G. D. Bryon, Mayor of Charleston, and several other prominent gentlemen.

On Wednesday, the 17th, several papers were read, one of which pointed out the dangers of diphtheria, and how the disease can spread through the carelessness of those coming in contact with it. Also how the disease was sometimes conveyed into families by pet animals and birds which were afflicted with it such as cats, rabbits, guinea pigs, chickens and pigeons. Those animals and birds being often handled and petted by children have been the channel through which the disease was conducted into the families.

Another paper was read on the subject of what constitutes a filth disease, showing the dangers of the stagnant ponds, decaying vegetables, rotten garbage, and so forth.

In the afternoon the Association was given an excursion by the Emerson Car Ventilating Co., to inspect their new mode of ventilating cars. Your representative did not go on that excursion as he had other work on hand which required some attention, namely, calling on some of the Charleston plumbers.

At the evening session several interesting papers were read. The first being on the subject of Underground Waters for Public Purposes, by Peter H. Bryce, M. D., Toronto, Canada, showing the danger of the shallow wells and the benefits of the artesian wells, with which no doubt you are more are less acquainted. Another one by Joseph A. Raymond, M. D., of Brooklyn, N. Y., on the subject of Sanitary Improvements of Stagnant Lakes near the Seashore, illustrated by stereopticon views, showing how a stagnant pond at Coney Island was transformed into a beautiful lake, which now abounds in fish, crabs, etc. This was accomplished by means of a kind of canal lined with heavy spikes and planks. Being wide at the inlet and somewhat narrow at the ends next to the pond, and slightly elevated toward the same, with an abrupt descend or apron at this point, so at each rising of the tide, the waves of the sea were forced into this canal and falling over the apron, at the other end had no means of returning, and so the tide flowed in at one end and out at the other; which makes a beautiful lake by the seashore where once was the stagnant and disease breeding pond of filth.

Another paper was read on the Treatment of Sewerage by Precipitation and Saturation by Joseph H. Raymond, M. D., Brooklyn, N. Y., illustrated with the stereopticon views, showing how the sewerage at Coney Island was disposed of by being mixed with disinfectants and washed through filters from one tank to another until purified, at a very small cost per diem.

Two other papers were read, on the Artesian Wells of Charleston, and the Tidal Drain System, the one by A. Nelson Bell, M. D., Brooklyn, N. Y., and the other by L. J. Barbot, City Engineer of Charleston, pointing out the great benefits the three artesian wells were to the city and the benefits derived from having the sewers of Charleston flushed out by the tide. It may be of interest to some here to know that the city of Charleston is very low, possibly the highest point not being more than six feet above high water mark, so that when the tide rises, all sewers are filled with water; then the water is held in them by means of closed gates until the tide has gone out, when those gates are opened and the sewer flushed thoroughly, so that the force of the current is sufficient to throw a brick fifteen or twenty feet. This system of doing things seems very pleasing, but Mr. Barbot said nothing in reference to another system of sewerage which is likely to pay the people of Charleston large interests on their deposits.

This is a system whereby all the water-closets are conducted into vaults in the back yards. It is not necessary for me to say anything regarding the unsanitary condition of such a system as this. You gentlemen here to-day, know well what is liable to follow.

On Thursday, the 18th, after some routine business, a paper was read by Frederick Montizambert, M. D., quarantine officer of the Dominion of Canada, showing forth the vast amount of foreign born paupers we have in this country, and where a case of leprosy was overlooked in Liverpool and detected in Boston. The paper also went on to show the great necessity of having all emigrants vaccinated before leaving any of the foreign ports. Another paper was read by H. B. Harlbeck, M. D., quarantine officer of the port of Charleston, on maritime sanitation at ports of arrival, showing how the port of Charleston was looked after, with dates as far back as 1683, showing that when people came to that city with a contagious disease a fine of five hundred pounds in English money was imposed, and if unable to pay said fine, they were publicly whipped in the streets of Charleston.

In the afternoon the association went on an excursion around Fort Sumter and the quarantine station. Your representative did not go with them on this occasion, for the reason that he had made other arrangements and was at that time holding a meeting with the Master Plumbers of Charleston.

Another interesting paper on Land Monopoly; Its Relation to Health in Large Cities was read by Geo. Homan, M. D., of St. Louis, Secretary State Board of Health of Missouri, describing the condition of many families in the crowded districts.

On the 19th two other papers were to be read, one on House Drainage by Albert L. Webster, Sanitary Engineer of New York, and the other on Trap Siphonage, by Prof. Jas. E. Denton, of Stevens Institution, Hoboken, N. J. Neither one of the papers was produced, and after some reports of committees the meeting adjourned.

It may be interesting for you to know that those professional men realize the importance of co-operation with the members of this organization in order that they may learn something of the experience of the practical mechanics.

On the whole the meeting was interesting, but seemed to lack enthusiasm, there being very little debate, most of the time being devoted to the reading of papers which were interesting and no doubt very profitable. Respectfully submitted,

ROBERT GRIFFITH, President N. A. M. P.

On call of standing committees' reports, P. H. Murphy, of Milwaukee, chairman of the Essay Committe, stated that the committee was unable to get together and that nothing had been done. The Apprenticeship Committee reported as follows:

To the President and Members of the National Association of Master Plumbers.

GENTLEMEN: Your Apprenticeship Committee respectfully report that no business has been referred to us from the national or local associations, with the exception of one matter from the Pittsburg association.

A conference between representatives of the master plumbers, the journeymen, and this committee was held, and a set of rules for the government of apprentices was formulated and agreed upon. Notwithstanding this, as well as the fact that the master plumbers strictly adhered to said rules, the journeymen almost wholly disregarded them. In consequence of this the master plumbers took action, set aside all former agreements, and adopted a new set of rules of their own.

Your committee beg to offer the opinion that there is no particular reason for the existence of a standing national apprenticeship committee, and would recommend to your body its abandonment.

JAMES G. WELDON,
JOHN M. TATE,
I. K. BECKER, Committee.

The report was received and the recommendations referred to the Executive Committee.

The following is the

REPORT OF SANITARY COMMITTEE.

PLAINFIELD, N. J., June 20th, 1891.

To the Officers and Members of the National Association of Master Plumbers of the United States, at the Ninth Annual Convention at Cincinnati, Ohio, June 23rd, 1891.

GENTLEMEN: In its search for information, and to avoid the semblance of probing into trade grievances which come within the sphere of your more aggressive workers, your Sanitary Committee deemed it expedient to prepare and forward to the Health Boards as well as plumbers throughout the country a circular letter asking for explicit information regarding the sanitary condition of our cities and towns. The following is a copy of the letter as well as blank form for replies, designed to cover the field of our investigations:

Office of Sanitary Committee of the National Association of Master Plumbers, 8 North Avenue, Plainfield, N. J., April 1st, 1891.

Dear Sir: Having been called to the above responsible position at the last Annual Convention of the Master Plumbers of the United States, it becomes our duty to take prompt and energetic measures to show the public that the plumbers are alive to the requirements of the times, and are willing to do their part towards the advancement of sanitation.

The day for idle protests has passed, and as we are closely connected and interested with the National Board of Health, and desire to show that we mean business, let us see if something practical cannot be done which will show that the plumbers are earnest, determined and honest for sanitary reform; we want facts, figures, and information from every part of the country regarding the Health Laws and sanitary condition of our cities and towns, with suggestions and advice regarding the best means of improving the plumbing, drainage, ventilation and sewerage system as now existing.

Looking for prompt responses and hearty co-operation we enclose blank, which please fill out with such facts, etc., as come within your knowledge.

Fraternally yours,
D. W. LITTELL, Chairman,
JAS. F. BLACKSHAW,
CHAS. SPITTLEHOUSE,
JOS BUDD,
J. B. KING, National Sanitary Committee.

Chairman's Address, 8 North Avenue, Plainfield, N. J.

Office of The Sanitary Board, City of.....State of.....

Dear Sir: Having received your enclosed communication from the National Sanitary Committee of the Master Plumbers Association of the United States, we are pleased to fill out the following reports:

System of sewerage? System of drainage? System of water supply?
System of ventilation? Style of water closet mostly used, earthen or iron?
If vented, how? Style of traps mostly used? If vented, how?
Have you rigid sanitary laws now in force?
Do your laws compel plumbers to do first-class sanitary plumbing?
Are all plumbers in your city licensed? Is everybody allowed to do plumbing? Do you enforce your sanitary laws?
What is your proportion of death rate and causes of same?
Please send us a copy of your Sanitary Laws.
Name of President,
Profession or occupation.
Name of Chief Inspector,
Profession or occupation,

Responses were received from different parts of most of the states throughout the Union, and, while in many reports they are not as full and explicit as would be desired, it is gratifying to note that as a whole they indicate a marked improvement in the sanitary condition of our country.

More than seventy-five per cent. of the replies betoken a satisfactory and healthy state of affairs, which it is well to note in many instances is ascribable to recent improvements.

Despite the fact that we endeavored to keep well within the province of our mission, the brief replies called for were generally to the point and at times spoke more than volumes in picturing the gravity of the situation. We all know what it means when a plumber writes that "they have no sanitary laws and the work is done principally by tinkers and stove men, and that every one buys their own fixtures and puts them in as they please."

The sanitary condition of Lincoln, Nebraska, is evidently satisfactory, owing to the energy and activity of Chief Inspector K. B. Trafaly, who is the alert catcher of the noted Lincoln Base Ball Club.

There is a suspicion of satire in the report from one locality where the health of the city is given as "highly satisfactory" and the death rate is "good," when we observe that the Health officer is a practicing physician, and the inspector an undertaker. But we deem it impolite to particularize regarding the sanitary or unsanitary condition of particular localities, as our investigations were somewhat of a confidential nature and in many instances not given for publication. We note with keen satisfaction, however, that where good plumbing regulations do exist they are prized and appreciated, and that where such is not the case there is a strong and earnest desire for improvement.

Your committee has been duly impressed with the importance of good sanitary regulations and their strict and impartial enforcement, and cannot close without recommending the passage of State and National Health laws as the crying want of the country.

We found a universal dissatisfaction where good plumbing laws do not exist, and many complaints about inadequate or poorly enforced regulations, but in no instance was any substitution or remedy for the evil complained of suggested. For this reason, therefore, to aid those who are in need of information, and to put the Master Plumbers of the United States clearly on record, we believe that it comes closely within the duty and province of that august body to prepare and disseminate an ideal set of plumbing laws and regulations, which will be suitable, for cities, towns and villages, and for which we can agitate and fight until we have uniform sanitary laws relating to our craft, throughout the entire country.

Most respectfully submitted,
D. W. LITTLE, Chairman.
JAS. F. BLACKSHAW,
CHAS. SPITTLEHOUSE,
JOS. BUDD,
J. B. KING, National Sanitary Committee.

The report was received and referred to the incoming Executive Committee. In connection with Philip Murphy, T. C. Culloton, J. P. Gallagher, C. J. Prescott and Oscar S. Miscally were appointed on the Essay Committee. On call of reports of retiring officers, President Griffith presented the following.

PRESIDENT GRIFFITH'S ANNUAL REPORT.

CINCINNATI, O., June 23, 1891.

To the National Plumbers' Association of Master Plumbers of United States, now assembled in your Ninth Annual Convention.

GENTLEMEN:—The time has now come that an account should be rendered of my official labors, and an outline of the year's work throughout the country.

I might say that when you confered upon me, in the City of Denver, the greatest honors that were in your power to bestow, I felt somewhat uneasy. After listening to the excellent report of my predecessor, Mr. Hannan, I supposed that the work was all completed and that the country was thoroughly organized, and when the time would come for me to give my report, the showing would be very small, and instead of fruit I should have nothing to bring you but leaves.

But I resolved if my health was spared, that whatsoever my hand found to do, I should do it with my might, and it was not long before the way was made clear and plenty of work in sight and a great deal more remains for my successor to do. It is very encouraging for the National Association of Master Plumbers of the United States to see the progress which is being made throughout the country in the advancement of Sanitary Plumbing; and it is hoped that ere long the plumber who has a desire to do good work will be appreciated and be able to obtain a fair recompense for his labors.

The physicians and those interested in public health throughout the country are realizing the importance of the plumber, and it is certainly to our interests to co-operate with them in order that the health of all may be protected. By so doing we shall be able to have our state laws so amended as to keep the unskilled and unscrupulous out of the business. Our trade protection during the year with but few exceptions has been well taken care of and our Baltimore Resolutions stand almost as strong and impregnable as the rocks of Gibraltar.

My first official visit as your president, was to the city of St. Louis, having received an invitation from the Master Plumbers of that city to be present with them on the occasion of their annual picnic and excursion. The plumbers of the association with about fifteen hundred of their relatives and friends, got on board a large steamer and proceeded up the Mississippi to a beautiful grove, where all spent the day and seemed to enjoy themselves to their hearts' content, and had the pleasure of a moonlight excursion on

our return home. I would recommend such excursions to all local associations who have means to enjoy them. I consider they are of great benefit to the upbuilding of the trade in all our cities.

My next visit was to the city of Dallas, State of Texas, where I spent three days with the plumbers of that state, and had the pleasure of welcoming them into our National Association, and they are with us here to-day. From there I went through the state of Kansas and visited the cities of Wichita and Topeka, and our friend Foley of Leavenworth. I then visited Missouri, stopping in Kansas City and St. Joseph. From there I went to Nebraska, stopping in the cities of Lincoln and Omaha. After which I visited Iowa, stopping in Sioux City and Cedar Rapids, arriving home after an absence of two weeks. In December I went to Charleston, S. C., as your representative to the American Public Health Association, and being desirous of doing some good by the way I visited Chattanooga and held a meeting with the plumbers of that city and as a result they are with us to-day for the first time. I then proceeded to Charleston, where another association was organized. Afterwards the city of Columbia was organized by State Vice-President Oscar S. Miscally, and South Carolina is represented here for the first time by two cities. After leaving Charleston I stopped at the city of Atlanta, Ga., and organized an association. I have written several letters there since, but for some reason they have never joined our National Association. From there I proceeded to the city of Nashville, Tenn., and thence to Louisville, Ky., arriving home after another absence of ten days. In the month of January I visited Milwaukee on the occasion of their annual banquet, which was very pleasant and profitable to the plumbers of that city. The next day I started for a visit to Ohio. My first stopping place was in the city of Toledo, where an association was organized and they are with us in convention for the first time. From there I went to Cleveland and then to Columbus, where I was joined by Vice-President Joseph A. Macdonald, Treasurer M. J. Lyons and W. G. Reid, of Rochester; after spending an evening with the plumbers of that city we proceeded to Cincinnati, where your executive committee spent three days steady work and attended a meeting with the plumbers each evening. At the close of our labors I, in company with Ex-President Hannan, Vice-President Macdonald, Treasurer Lyons, and W. G. Reid, visited the city of Louisville, and had the pleasure of seeing the association of that city re-organized, and they are here to-day in their old time strength.

From there I went to the city of Evansville, Ind., and had the pleasure of organizing an association, and they are also with us on this occasion. I then went to the city of Indianapolis and spent a day and a night with the association of that place,—arriving home after an absence of twelve days. In March I visited the cities of Milwaukee and LaCrosse, Wis., and St. Paul and Minneapolis, Minn. In May I visited Sioux City, Iowa, and attended the state convention of Master Plumbers in that place. Great interest was shown by the attendance of members of the trade from different parts of the state. This was the conclusion of my visits. I must say although at a great sacrifice of time from my business that the pleasure of meeting the local associations throughout the different parts of the country fully repaid me for all. I did not only enjoy the meeting with the associations already organized, but it was a great pleasure to me to go to a strange city where I knew nobody and inquire from the clerk in the hotel or some one on the street, "where I could find a plumber's shop," and then go and introduce myself to the first plumber I found and ask him to come along and make me acquainted with some of the others. This I did in seven cities, and as a result five of the seven are represented in our convention at the present time. The other two, Cedar Rapids, Ia., and Atlanta, Ga., were organized, and no doubt my successor will have the pleasure of welcoming them into the national fold during the coming year. I do not wish to detain you here listening to a report of the little incidents that occurred in those cities, but one prominent plumber said to me: "Well, Mr. Griffith, I do not want to discourage you but I do not think it is worth while for you to waste any of your time in this city, it will not do any good." I assured him that I was not going to waste any time, that I had a few hours to spend in the city and that I wanted to get acquainted with some of the plumbers. He kindly consented and went around with me. I am pleased to say that representatives of seven shops met that day and formed an association; this being all the principal ones in the city. That same gentleman is a delegate on this floor to-day from his city. This is only one of many instances of that kind which occurred; but on the whole my visits were very pleasant and much enjoyed by me. During the year I visited twelve states and twenty-six cities. Some of those cities I visited twice; I am now in Cincinnati for the third time. I have traveled by rail in the interest of our National Association, 9,244 miles.

There has been written from headquarters 878 letters; forty by Secretary Alcock, and eight hundred and thirty-two copies—making a total of 1,640 letters during the year; and I am glad to report that all the correspondence was of the friendliest nature, and it is hoped will be productive of great good. But I have learned by experience that one day's personal work is of more value than one hundred letters. It was by personal work on the part of State Vice-President Shannon and Mr. Mitchell of Boston, with some of the other plumbers of that city, that several new associations were formed in Massachusetts. It was by personal work that State Vice-President Fallon of New York was about to report some additions in his state. Also personal work by State Vice-President Shulhafer of Kentucky and Mr. Murphy and McNeil of Cincinnati, that the city of Covington was organized, and State Vice-President B. F. Coll, of Pennsylvania, through personal work organized Oil City and vicinity. Personal efforts on the part of our friends Cummings and Lyons of Brooklyn and Mr. Frazer of New York, that the associations of California and Oregon were strengthened and encouraged. Personal work was done by many others too numerous to mention. Too much cannot be said for the work of the members of your Executive Committee, who were all untiring in their labors for the benefit of our National Association. When they were called upon the platform in the city of Denver one gentleman said to me, "Griffith, you have the best Executive Committee that ever was appointed." I believe myself they were second to none. I desire to extend to them my sincere thanks for their earnest co-operation in the work of the year.

I am grieved to announce to this convention the death of one of our officers, Mr. K. J. Owens, State Vice-President of Oregon. He was unknown to many of us, but we know through correspondence that he was a faithful worker and one who will be greatly missed in that section of our country.

I wish to thank each one of the ex-Presidents of this association, also Vice-President Macdonald, for the kindness shown me. Their friendly letters full of wise counsel and advice were too rich to be forgotton. And what shall I say for the other members of the Local Associations throughout the country, many of whom we, who are here, may never see; but we cannot help but admire them for their co-operation with us. We may have good generals to plan and give orders, and good officers to command, but if we have not good private soldiers to do the fighting, we will never accomplish the end in view. To those private soldiers belong a great deal of the honors, and in conclusion I desire to give my sincere thanks to the trade press of the country, for their zeal and energy in aiding us to carry forward the good work of trade protection and sanitary science, and I do earnestly hope that my successor and his cabinet may receive the same hearty support and sympathy that has been my privilege to enjoy.

Respectfully submitted,

Robert Griffith,

President, N. A. M. P. of U. S.

The report was received and ordered spread in full upon the minutes. The reports of the State Vice-Presidents were called, and at the close of the report from Pennsylvania, the Executive Committee presented its report which was read and ordered spread on record, and the recommendations referred to a special committee. The President appointed the following as members of the committee: John Trainor, J. J. Wade, D. G. Finnerty. Vice-Presidents' reports were continued till time for adjournment when the convention adjourned to go into executive session at 2:30 o'clock.

WEDNESDAY AFTERNOON SESSION.

The executive session lasted till 5:30 o'clock, at which time the regular session was called to order. Reports from State Vice-Presidents were concluded. The Financial Secretary made the following report:

To the President, Officers and members of the National Association of Master Plumbers of the United States.

GENTLEMEN: Your Financial Secretary respectfully submits the following report of the receipts of money received during the current year.

I was ordered by the Executive Committee to call in the first 50 per cent. of the per capita tax on December 6th, 1890 and on March 15th, 1891, the remaining 50 per cent. of two dollars. Total, $2884.25. In comparing the above collections with the collections of last year of $3138.50, I find an increase of $745.75.

Respectfully submitted, J. J. HAMBLIN.
Financial Secretary.

The Treasurer reported as follows:

TREASURER'S REPORT.

CINCINNATI, Ohio, June 23, 1891.

Treasurer's report to the Ninth Annnual Convention of Master Plumbers of the United States.

MR. PRESIDENT AND GENTLEMEN: I have the pleasure of presenting for your consideration my annual report as follows:

Receipts—From late treasurer Mr. J. Sheehan, $1124,48; from Financial Secretary, Mr. J. J. Hamblin, $3834.25; total amount $5008.73; Totoal amount expended 3040.29; cash on hand, $1968.44; total, $5008.73. MORTIMER J. LYONS,
Treasurer.

The Executive Committee, to which a resolution was referred at the Denver Convention that the National Association recommend to the Directors of the World's Fair the name of a member of this association for the position of sanitary superintendent, presented the name of Alexander W. Murray of Chicago for that position. Convention adjourned till 9 o'clock Thursday morning.

THURSDAY MORNING SESSION.

President Griffith called the convention to order at 9:15 o'clock. The roll call showed 85 delegates present, but a full house soon assembled. Secretary Allcock read an essay presented by W. A. Kelley of Cleveland, regarding municipal inspection of plumbing. The essay was received with applause and referred to Essay Committee for a slight correction.

The Committee on Resolutions reported as follows:

REPORT OF COMMITTEE ON RESOLUTIONS.

CINCINNATI, O., June 24th, 1891.

To the President and Members of the N. A. M. P.

Your Committee on Resolutions respectfully report and recommend as follows:

1st, That the resolutions in exhibit marked No. 10, relating to license legislation, be adopted, as follows:

LICENSE SYSTEM.

To-day we are congregated in general assembly for a worthy and responsible purpose. We did not leave our homes and our business in pursuit of pleasure (though it may be indirectly obtained, since it is always a pleasure to meet our friends), but for the honor and glory of a noble cause, namely: the promotion and the protection of the health of the people in our grand republic. We did not come here to flippantly discuss the great questions that concern our vocations, but to seriously and beneficially consider the subjects that are here presented for our deliberation. It depends, therefore, on our various dispositions whether we will conscientiously enter into this work, and elevate the cause which brought us together, or condemn it to oblivion by our indifference. In the National Association of Master Plumbers many questions of national importance concerning advancement in sanitation have been so successfully agitated that we are already enjoying the fruits of our union. A system of reform has been inaugurated, results that were hitherto regarded as impossibilities are now in a flourishing condition, and we naturally feel a thrill of just pride arise within us when we reflect on what organization has done for us. But are we contented to rest here; must the trophies of past victories be sufficient to satisfy our ambitions for the future?

No, we must pursue our aims still higher if we would attain a more reliable plane of perfection. Although many difficulties have been overcome, many evils combated, there still remains much to be accomplished which is of utmost concern to each individual member of this organization. There is an underlying current that is working against us; as we attempt to approach and crush out its viciousness in one form we find it bobbing up serenely in a new phase, and it is generally accompanied by some stronger forces. This foe may be said to represent our license system.

If we would smooth out the complications involved by the contemplation of this system, we must speak out our thoughts and honest convictions and then proceed to adopt measures that will justify our aims and uphold our dignity. Plumbing is now in a state of transition, on account of the revolution in public education with regard to sanitary affairs. Merit is continually gaining strength at the expense of other influences, and in the endeavor to establish a new license system, our primary idea is to protect merit and reward the competent artisan.

It has been ascertained that by a new regulation of the license system we are endeavoring to antagonize the interests of those whose business careers do not extend over a long period of years; but this objection comes from those whose positions as Master Plumbers are not secure, and who are intimidated as to the possible outcome of this reform, lest it leave them "out of a job." If they were competent, no such fear would assail them, and they would enthusiastically defend the policy we are now striving to establish. Let us consider a few of the abuses we are now subjected to on account of our faulty license system.

I cannot better illustrate the frailty of this system than by giving an example which came under my personal supervision. Some time ago a young man applied to me to be received as an apprentice into the plumbing business. He proved to be the same as all others, not any more intelligent, nor any more capable than were the other boys in my employ; in fact, if the truth must be told, he was more backward than the generality of boys. He worked for about a year and a half, when, on account of his habitual acts of insubordination, I was obliged to discharge him. Judge of my astonishment when I learned the following week that he was engaged in business as a full fledged master plumber. Now, what right, according to reason, entitled him to this position? Do you think him a capable man to enter your abode and make a statement concerning the sanitary condition of your dwelling? He must be a prodigy could he acquire in eighteen months what it takes a conscientious man years to master. But we have no such prodgies in our business, at least I have never heard of them. Judge then of the awful responsibilities undertaken by that boy? On hearing of such cases the public inquire, "Will anyone hire such frauds?" "Oh, yes," we reply, "their workmanship is not only accepted but sought after, because it is cheap." They do not realize that they are the victims and how they are being deceived by their false economy. These men can afford to work cheaply since their knowledge is so limited; they do not realize the crime of substituting poor for good workmanship, and hence are ignorant regarding the loss of life their blunders occasion.

Why, then, is there not some safeguard to protect the public from these imposters? The only and best means by which these men could be reached and brought to justice is through a correct license system. We regret to say that the manufacturers and dealers in plumbing materials encourage this class of tradesmen, since they give them unlimited credit with as much cordiality as they bestow on those whose monthly accounts range in the thousands. They are so anxious to sell their goods that they do not consider that the manner in which they are placed in a building is necessary for their successful operation, and how much dissatisfaction may be traced directly to this source.

What must we do then to protect our trade, to protect our people, and to protect our reputations? We must above all demand that each man who wishes to enter the plumbing trade first prove his competency by passing a satisfactory examination before a board of sanitary experts appointed by a state or municipal government for this purpose. We must demand that the manufacturer and dealer in plumbing materials concur with us in the endeavor to protect trade interests by selling goods only to those recognized by the state as competent men. We must obliterate this mode of license which renders possible a state of unjust and unprincipled competition. Gentlemen, are you prepared to do this, or are you satisfied to continue to be the subordinates of a band of uneducated, unskilled mechanics? If you are pleased with this present condition, my words have been uttered in vain; but if you are oppressed with this thralldom and desire to shake off these chains of bondage, let us rise to a man and determine to free ourselves from these evils which lower the standard of our trade and which encroach upon the sacred precincts of our reputation.

In view of the foregoing the following resolutions have been drawn, and are now respectfully submitted to your approbation:

Resolved, That the continued and increasing evils proceeding from a deficient license system are destructive to our rights as Master Plumbers and that such evils cannot be removed without the concerted action of the members of this organization.

Resolved, That a new license system be promulgated, controlled by the state or municipal government.

Resolved, That the state or municipal government appoint a board of plumbing experts whose duty it will be to examine and qualify all applicants for license to conduct the plumbing business.

Resolved, That the present license system is responsible for the injustice that is done us through the manufacturers and dealers in plumbing materials.

Resolved, That manufacturers and dealers in plumbing materials be prohibited from selling goods through a third person. That is, that no consumer can be permitted to become security for a mere journeyman plumber or other spurious individuals who, on the event of obtaining a license, become the special agents of said consumer.

Resolved, That none be licensed Master Plumbers except those who carry on their business in a legitimate or proper manner by having said business located in a store or shop devoted to this purpose.

Resolved, That the vice-presidents of the various states be empowered to issue a call to a requisite number of members within their jurisdiction in order that the acts of these resolutions may be put into a speedy and successful operation. J. J. WADE, 112 Dearborn Street, Chicago, Illinois.

2nd. That the resolution in Exhibit No. 11, relating to the sale of gas fixtures be adopted except articles 4th and 5th, as follows:

RESOLUTIONS.

1st. No member of the National Association of Master Plumbers shall purchase anything from manufacturers who allow their agents to sell to, or solicit orders from, consumers.

2nd. That no member of the National Association of Master Plumbers shall hang gas or electric fixtures of any kind, purchased by consumers or consumers' agents from manufacturers, in their retail stores, unless full discount be obtained on same.

Gas and electric fixtures shall be sold only to the dealer, excepting those purchased by consumers in the retail stores of the manufacturers, and sale of same made only in the cities in which the manufacturers are located.

3rd. All gas and electric fixtures sold by manufacturers in their retail stores are to be turned over to the dealer or dealers who are customers of manufacturers making sale in the city or town in which the goods are to be used, or to dealer designated by the purchaser, and full discount allowed dealer.

Pittsburg delegates, ALLEN MCFADDEN, President.

3rd. That the resolutions in Exhibit 12 relating to the classification of inventing plumbers as dealers be accepted, as follows:

National Association of Master Plumbers:

Gentlemen,—We desire to call your attention to Article II, of the Constitution and By-Laws governing the National Association of Master Plumbers of the United States:

Article II,—Objects.

This Association is organized for sanitary, commercial, and social purposes, and has for its special objects the advancement of the trade in all the latest discoveries of science appertaining to sanitary laws; to promote and combine the intelligence and influence of members for the protection of the trade against imposition, injustice, or encroachments upon our common rights or interests; encouraging inventions and improvements in sanitary appliances; fostering an interchange of thought, and eliciting and communicating for the benefit of each member, the best talent and the result of the experience and ability of all: Therefore, be it

Resolved, That plumbers regularly engaged in the plumbing trade, and manufacturing goods of their own invention, and selling such goods only, are not defined or classed as "Wholesale Dealers in Plumbers' Supplies."

Resolved, That plumbers regularly engaged in the plumbing trade, receiving letters patent on sanitary appliances of their own invention, and manufacturing said appliances, or causing them to be manufactured, receive our patronage and aid.

Resolved, That plumbers regularly engaged in the plumbing trade, and selling and dealing in plumbers' supplies at wholesale or retail, wholly or in part, goods not of their own invention, are classed as wholesale dealers in plumbers' supplies.

Resolved, That plumbers regularly engaged in the plumbing trade, selling and dealing in plumbers' supplies at wholesale and retail, are acting in a double capacity and are unfair competitors and are not deserving of our patronage.

By J. J. Wade of Chicago.

4th. That the first two resolutions contained in Exhibit No. 13 relating to soil pipes and fittings and testing the same be adopted, and further recommend that the manufacturers and jobbers complying shall be entitled to receive our patronage, as follows:

(By Matthew Mandable of the Chicago delegation.)

To the Master Plumbers of United States, in convention assembled:

Gentlemen:—1st. *Be it Resolved*, That manufacturers of cast iron pipe and fittings be required to test said cast iron pipes and fittings at their factory, and evidence of said test to be stamped on each length of pipe and fittings.

2nd. *Resolved*, That we encourage the use of extra heavy cast iron pipe drainage in buildings.

5th. That the resolution and ritual of Exhibit No. 14, be referred to the incoming Executive Committee for their favorable consideration, as follows:

The subject I wish to bring before you for your consideration is one of vast importance towards the success of any organization, from which the effects and benefits are self-evident. They may be seen in all the great results that men have accomplished, in military achievements, political operations, the prosecution of public works, as pyramids, canals, railroads, bridges, public edifices, etc. All of which owes its success to close organization, for which a labored effort is hardly necessary to persuade intelligent people of the advantages to be derived. What has been accomplished in all these directions has been by united effort, concert of action, co-operation, organization. A single individual cannot accomplish great physical deeds, but a body of men joined together with one purpose can perform wonders. The Master Plumbers' Association has done a great deal of good in the past, but now comes the time to take the necessary steps to make it more effective. The good results are almost immediate. The social and educational advantages of close organizations are very great and far more than pay for their perfection. Organizations of one kind, meeting together at regular periods, are capable of doing much towards fostering a friendly regard, increasing a brotherly feeling towards each other, enlarging mental culture and in giving direction and effectiveness to individual force and aim. Let us perfect our organization for our own social and business interests, our mental improvement and to utilize our strength in the community in which we live. If we duly respect ourselves, if we step forward and take the position we ought to occupy, we shall be respected by our fellow men and the rights and opinions which we hold dear will be strengthened and spread over our fair land. It matters not what our religious or political belief may be they will not conflict by uniting our efforts towards the furtherance of this great movement. Above all things, let a spirit of liberality towards the opinions of others be duly exercised. Let a proper respect for the views of our fellows be generously maintained. It is neither possible nor desirable that all should arrive at the same conclusion, that all should think exactly alike on theological, scientific and phylosophical subjects. Let us not demand it. Let us lay our platform so broad that all classes can stand upon it. It is therefore necessary and extremely essential that a safeguard should be established, whereby the principles and laws that govern our organization should be secret.

Some there are who oppose secrecy, but who utter their opinions without any shadow of thought, because they condemn what they do not understand.

They say, if such secrets were exposed, the community would reap far greater advantages. This mode of reasoning is false; the principal secrets of all orders are generally composed of signs, tokens and pass words, whereby they know each other from the rest of mankind. If such signs were exposed, the usefulness of the safeguard, the efficacity of the order would cease. Secret societies embrace three grand principles, unity, benevolence, and philanthropy. These principles should be thoroughly mastered and completely understood, and then carried out strictly and cautiously.

When such a safeguard is established, each member thereof should be obligated to act in harmony with his associates, to perfect unity not only in society but all matters that may arise in which they become involved. If the unity is brought to such a high and estimable standing, it must certainly lead to benevolence. The inspiration of men to love his fellow being, to respect and honor him, is sufficient to make him benevolent; by lending a helping hand to the needy, his thoughts are fostered on his obligation, and his heart and soul are impressed with the principles laid down for his guidance, by which man, when sickness or distress visit him, shall be protected, soothed and cared for, by which the oppressed and downtrodden shall be relieved; by which the afflicted shall be inspired with new vigor; by which the widow shall be nourished, and the orphan have a father's hand to guide his footsteps through the steep arena of life, where man shall journey to distant lands that he shall be enabled to meet one who, with heart and soul, shall recognize him as a brother. Again let the benevolence extend when a member is sick, a physician is ready to attend, a weekly allowance allotted, his brethren condole and care for his wants, and no pains are spared for such comfort as his condition requires. When in distress, see the readiness of his fellow members to sustain him, to raise his courage that has failed, and to enable him to fulfill his former position that he can regain a respectable standing in society. Such are the benefits of a safeguard, and such are the principles for the master plumbers to adopt. With these principles and meaning at heart, and a clear, unbiased and unprejudiced conscience, we can enter on our duties and act in accordance and in conformity with the rules laid down for the guidance of a true and sympathizing plumber: Therefore, be it

Resolved, That we, the National Association of Master Plumbers of the United States, adopt a ritual for the guidance and form of opening and carrying on of meetings of all local associations; be it further

Resolved, That it is the sense of this convention that the Executive Committee notify all local associations for their action at the next annual convention on Endowment law with an insurance of $5,000, assessed pro rata on each member, on the occurrence of the death of a member in good standing. Respectfully submitted, Chicago Delegation, per Thos. P. Culloton.

6th. That the amendments in the Constitution and By-laws in Exhibit No. 15 be not concurred in.

7th. Your Committee on Resolutions further recommend that the matter contained in Exhibit No. 16, relating to protection and the creating of an additional officer, etc., be not concurred in. Very respectfully,

William H. Rothrock.
Thomas G. Boyd,
James G. Weldon,
W. J. Freeney,
Daniel Shannon.

Andrew Young was called on for his essay, and came forward and read his paper entitled, "The Work of rhe National Association." The reader was frequently applauded, and at the close of the paper, the convention gave evidence of its appreciation in long continued applause. On motion a vote of thanks was extended to Mr. Young, and a sufficient number of copies of the paper was ordered to supply each member of the National Association with one.

Secretary Alcock submitted the following report:

SECRETARY ALCOCK'S REPORT.

Mr. Chairman and Gentlemen of the Ninth Annual Convention of the National Association of Master Plumbers.

I hereby submit my report for my official term of office as Secretary for the past year.

Permit me to quote the record for the year proceeding the one about to close. At our first convention held in New York the association throughout the United States was represented by 125 delegates; and the enthusiasm enkindled by some of our stalwarts at that time has been kept up from time to time by accessions to our ranks.

The second year of our meeting 154 delegates were called together at Baltimore, and while perhaps some new faces appeared, they were always a credit to our association; some new ideas were brought out and acted upon. Our association had come to stay. Our fame traveled abroad; our proceedings were published throughout this broad land and were copied and spread before the eyes of our brothers across the deep Atlantic.

Our third year at St. Louis was one of no small consequence. We numbered in our convention some 151 delegates, and although not so well represented as the year prior, still we were working on the same old line, protection. Then it was we saw the importance of our work and the power necessary to control it. The famous B. R. had been planted and signs of growth began to appear; carefully were they guarded and watched lest some weed or thistle should appear, and to-day they stand forth like the gold dug from the mountain stream, pure and untarnished.

At our Fourth Convention held at Deer Park we mustered to the number of 139; no increase over former years, but still a good healthy showing.

Our Fifth Convention was held in Chicago and we find on our record delegates to the number of 166. Here we find an increase again.

Fresh material, renewed and concentrated efforts, brought the abundant harvest.

Our Sixth Convention held in Boston was largely attended, 212 representatives being at that convention as delegates.

At our Seventh Convention held at Pittsburg, we lost two in number, 210 delegates answering the roll call.

Our Eighth, although held at a point at the extreme western boundary of our circle, and consequently difficult for many to be present, was well attended, there being 180 delegates present, and a right royal welcome did they receive.

Our Ninth and present Convention, with the strenuous efforts of your officers and State Vice-Presidents we are able to count 202 delegates, and an increase of twenty-one over last year, and more than at any other preceding convention during our existence with the exception of the Boston convention.

The following is a list of the new associations formed during the past year: Butte City, Montana; certificate issued January 3rd, 1891, membership 10; President, Louis Eschle, 38 Broadway; Secretary, J. Kreeger, West Granite street. Members: H. T. Van Buskirk, R. B. Gould, Thomas A. Arthur, Chas. W. Gould, John R. Colson. William J. Miller, Frank S. Davey, J. A. Hasley.

Chattanooga, Tennessee; certificate issued February 4th, 1891, membership 6. President, N. A. McQuade; Secretary, Julius Tschapik. Members: Fred Fox, R. Whigan, D. Carlin, J. J. Mack, W. W. Johnson.

Evansville, Ind.; certificate issued February the 25th, 1891; membership 6. President, Alexander Crawford; Secretary, Chas. Wahnseifler. Members: Lambert and Grant, S. A. Bate, Paul Musmussime, Crawford Bros.

Worcester, Mass.; certificate issued March 7th, 1891; membership 25. President, J. W. Jordean; Secretary, George W. Knapp; other names not given.

Ogden City, Utah; certificate of membership for 9, issued March 12th, 1891. President, M. Patten; Secretary, George Halverson; box 202. Members: Doyle & Halverson, A. W. Meek, W. W. Funge, James Macbeth, Lee Fitzman, Baltimore & Co., Thompson & Co., P. H. Bolfert & Co.; other names not given.

Madison, Wis.; certificate issued April 1st, 1891; membership 6. President, William Owen; Secretary, Edwin Mason; other names not given.

Los Angeles, Cal.; certificate issued ——— 4th, 1891; membership 19. President, S. M. Perry, 519 Broadway; Secretary, E. L. Burgoin. Members: H. E. Dascont, A. A. Burnett; other names not given.

Texas State Association; certificate issued November 5th, 1891; membership 40. President, F. J. Madden, Sherman, Sherman Co.; Secretary, Geo. Mummert, Dallas. Members: David Kirkwood, Sanataronia, W. W. Otter, Houston, Texas.

Seattle, Wash.; certificate issued June 16, 1891; membership 28. President, D. B. Spillman; Secretary, J. S. McClellan.

Altoona, Pa.; certificate issued April 1st, 1891; membership 12. President, Geo. W. Stewart, 1000½ Eleventh avenue; Secretary, Geo. R. Stone, 1009 Fifteenth street.

Helena, Mont.; certificate issued September 25th, 1891; membership 6. President, John Sturrock, 22 Main street; Secretary, B. L. Smith.

Louisville, Ky.; reorganized, membership 21. President, M. J. Duffy; Secretary, W. H. Matlack.

Haverhilt, Mass.; certificate issued October 30, 1891; membership 11. President, Charles Le Bosquet; Secretary, A. F. Sanders. Members: A. W. Crawim, Harry Blake, Mark S. Holmer, Geo. E. Smith, Jno. Duncan, Jr., Harry Le Bosserse, Dennis X. Xoakley, W. F. Sawyer, N. W. Wilkinson.

Charleston, S. C.; certificate issued April 13th, 1891; membership 10. President, W. F. Paddon; Secretary, A. B. Riddick. Members: A. J. Reilly, Oscar J. Miscally, J. S. Hyer, J. F. Tobin, J. J. Carey C. W. Blake, J. S. Barton. J. J. Finnegan, John Hallis, Wm. Welsh.

San Francisco, Cal.; certificate issued February 8th, 1891; membership 30. President, John Shephard; Secretary, W. T. Bush, 34 Geary street.

Oil City and vicinity, Pa.; certificate issued May 21st, 1891; membership 12. President, H. S. Mark Franklin; Secretary, T. N. Chambers, Oil City.

Mansfield, O.; certificate issued May 12th, 1891; membership 4. President, J. J. Tait; Secretary, Geo. H. Harris.

Covington, Ky.; certificate issued May 15th, 1891; membership 6. President, J. T. Underhill, 410 Scott street; Secretary, F. J. Maser, 817 Madison avenue.

Individual Members. August 25th, 1890; Barton A. Whitsett, Florence, Ala.

September 16th, 1890, Wm. Sofeliss, Woodbury, N. J.

March 7th, 1891, S. H. Bishop, Wahpeton, N. Dak.

April 1st, 1891, J. A. Monogan, Eureka Springs, Ark.

June 8th, 1891, J. H. Bradish, Batavia, N. Y.

June 8th, 1891, Edward O. Donoyhue, Ogdensburg, N. Y.; J. C. Sullivan, Oswego, N. Y.; M. B. Crawford, Oswego, N. Y.

June 13th, 1891, Cranlon & Gault, 130 California avenue, Oaklahoma, O. T.

Toledo, O.; certificate issued June 15th, 1891; membership 7. President, John A. Wait, 419 Madison street; Secretary, Jas. P. Lock, 430 Summit street.

Brocton, Mass.; certificate issued June 15th, 1891; membership 9. President, Thomas J. Kinney, 24 E. Elm street; Secretary, Daniel Synah, 7 Perkons avenue.

Besides the above new associations some have been reorganized and others strengthened and encouraged through personal efforts, so that at this convention we have a total addition to our National Association of 268 members, making a great total in our organization at the present time of 1968 members.

This record differs somewhat when compared with the Financial Secretary's books, where they show a per capita tax paid for 1564 members for last year, while for this year we find that the per capita tax has been paid for 1911 members showing an increase over last year of 347 members. During the past year 911 letters were written, 832 copies of letters sent out, making a total correspondence of 1743 letters.

Other matter will come in under other reports therefore it is not necessary to mention them.

In surrendering this high office I wish to extend to the National officers my most hearty thanks for their sympathy and support and to the members of this National body for their kindness and consideration. Very respectfully submitted,

J. R. Alcock,
Secretary N. A. M. P.

The report was received and a vote of thanks extended to Mr. Alcock for the efficient and able manner in which he had discharged his official duties.

The Auditing Committee reported as follows:

AUDITING COMMITTEE'S REPORT.

Cincinnati, June 25th, 1891.

To the Officers and Members of the National Association of Master Plumbers.

Gentlemen: Your committee appointed to audit the accounts of Financial Secretary and Treasurer have performed their duty and find the same correct. Respectfully submitted,

Jeremiah Sheehan,
George Cummings,
Chas. Polacheck.

REPORT OE EXECUTIVE COMMITTEE.

Cincinnati, Ohio, June 23rd, 1891.

To the delegates of the Ninth Annual Convention, assembled at Cincinnati.

Gentlemen: We, the Executive Committee, have the honor to submit a summary of our work for the year, as follows:

We held three meetings during the year, the first at Denver, June 20th, 1890, at the Albany hotel; second at Cincinnati, January 26, 27 and 28, 1891; third at Cincinnati, June 22nd, 1891, at the Gibson House.

First meeting, nine members were present; at the second meeting eight members, and third all were present. Standing Committees were elected as follows:

Auditing Committee—Ed. J. Hannan, Jos. A. Macdonald. Printing Committee—President Griffith, Alcock and Hamblin and Ed. J. Hannan, with power to have all necessary printing done. Bonds of Treasurer were placed at $2,000, and Financial Secretary at $1,000; with instructions that when executed, they be forwarded to the President for acceptance. Having been notified that Mr. Lyons, Treasurer, was going to the Pacific Coast to be gone for several months, Mr. Shannon, ex-Treasurer, was requested to continue to serve until Mr. Lyons returned and qualified.

Per capita tax was fixed at the same amount as last year, viz: two dollars.

The President was authorized to employ a clerk to attend to his correspondence.

A special committee of two was appointed, consisting of Messrs. Hussey and Reid, to consider the question of local and state representation, and report at our next meeting. Other detail work was referred to the Printing Committee, with power.

Second meeting at Cincinnati. At this meeting, a committee of three from the Pittsburg Association appeared and presented a communication from said association, and asked for a hearing upon the gas fixture question, the subject of the communication. After hearing the arguments of said delegation, a committee of three was appointed to report at the next meeting. The Committee consisted of Messrs. Gross, Humbert and Kennedy, to consider and report upon an agreement between the manufacturers and our members that are dealers in gas fixtures.

Letter was received from Mr. Muirhead of Portland, Oregon, informing us of the death of State Vice-President Owens. The Secretary was instructed to convey the sympathies of the Committee to his bereaved family, and Mr. Muirhead was appointed to fill the vacancy.

Semi-annual reports were received from State Vice-Presidents Lockhead, Shannon, Madden, Call, O'Neil, Doyan and Fallon.

Reports of violations of the Baltimore Resolutions were received, which took the usual course.

The parties complained of at the Denver Convention, issuing net price lists, between whom there was considerable correspondence, informed us by letter that they had concluded to discontinue the publication of the same.

State Vice-President having asked for information as to the payment of expenses in organizing in his state, the committee authorized the President to appoint any State Vice-President as member of the Executive Committee to organize in his vicinity. Expenses and prospects of success to be first considered by the President, and be approved by him.

In reference to state and local representation, the question referred to us at Denver, we recommend as follows:

That Article IV. of the Constitution be amended to read—"Where there are two or more master plumbers in any town or city, that they must organize either a local or city organization, a district or a state association, and that they shall pay the per capita tax and have the same representation; but in no case shall they be compelled to pay a double tax, or have double representation."

(Note.) Local or City Associations need no explanation. District Associations should be composed of individual members in small towns, to be organized into districts within a certain radius, to be laid out by State Vice-Presidents, and approved by the President.

State Associations can be made up of City or Local Associations, and can be combined, and have the same representation, one for every ten, provided they are not represented in either city or district; but in every case the per capita must be paid to have representation.

The Treasurer made his semi-annual report, which was received and filed.

We recommend that the Financial Secretary be allowed the sum of one hundred and fifty ($150.00) dollars for clerk hire; and that Article III. of the Constitution be amended, so that the Financial Secretary be no longer a member of the Executive Committee, but that his duties remain the same.

Letter from Mr. Remick asking for remuneration for services in past year, was considered and referred to this convention.

June 23rd was the day set for the opening of this Convention, and a committee of three, T. H. Hopper, Thos. McNeil and William Allison, of the Cincinnati Association were appointed to secure a hall and make other necessary arrangements for this convention. The President was instructed to request the ex-officers to turn over to this committee, all books, papers, and other property of this association in their possession.

Considerable time was spent in investigating some grievances in the city of Cincinnati. After a thorough investigation, the President was directed to inform the committee that we recommend that they, the plumbers and dealers get together and formulate an agreement, and forward the same to this committee for ratification.

The President was instructed to delegate Mr. Mitchell and State Vice-President for Massachusetts to visit the States of Maine and Vermont, if in their judgment it was necessary, to organize the same.

The following resolution and recommendation were adopted:

Whereas, It is a well known fact that the question of expense incurred in entertaining the National Association during its annual convention, and whereas this expense has been borne by the local association, thereby imposing tax that is unjust, that in the future we recommend that the sum of $1,000 be appropriated and paid to the Treasurer of the Entertainment Committee, when approved by the President and Auditing Committee; this sum to include payment for use of convention hall. The Committee would further recommend that the entertainment be simple in its character so as to avoid useless expenditures; in order to meet the above, we recommend a tax of fifty (50) cents on each member.

We recommend that Article IV. of the Constitution be amended to read: "That all ex-Presidents of the National Association of Master Plumbers be declared delegates-at-large, and entitled to all the privileges of a delegate, while in convention, so long as they remain in good standing in their local or state association."

Article IV. now reads: The National Convention shall consist of representatives from local associations, one for every ten members, or fractional part thereof, where such associations exist, who shall be elected at or before the first meeting in May of each year, and the President of each association to be a member by virtue of his office.

Whereas, Owing to the fact that a large number of dealers in plumbers' supplies throughout the country, who are also engaged in the business of plumbing, and

Whereas, There are a large number of plumbers who have by their ingenuity invented certain specialties tending to advance the science of plumbing who are the manufacturers or dealers in these articles, and which they seek to dispose of among the plumbers, thereby placing themselves under the head of both dealers and plumbers, and

Whereas, Such a condition of things has proven itself a source of annoyance, and has a tendency to disrupt local associations, therefore be it,

Resolved, That we recommend to all such as are engaged as dealers and also as plumbers, to abandon either one or the other in order that perfect harmony and good will may prevail, and the success of both thereby enhanced.

Respectfully submitted,

Robt. Griffith,	Ed. J. Hannan,
Jos. Macdonald,	W. F. McCarthy,
Jos. R. Alcock,	W. H. Mitchell,
M. J. Lyons,	N. B. Hussey,
J. J. Hamblin,	W. G. Reid,
	L. B. Cross.

The Special Committee reported on the recommendations of the Executive Committee as follows:

Report of Special Committee on Executive Committee's Recommendations.

I. As this recommendation is intended to compel individuals seeking membership at large in this body, to first affiliate themselves with their Local or State Associations, if they have any, before securing same; we therefore recommend the following amendment to Article V., which when amended will read as follows:

Article V. National Association.—"The officers and the delegates elected by the Local Associations, when inconvention, shall constitute the National Association. Where less than three master plumbers are located in one town, they may make application to the National Association, through the Executive Committee for membership. No individual member, however, will be admitted from cities or states where Local Associations exist." Approved.

II. We recommend that the Financial Secretary be allowed the sum of $150 for clerk hire. Approved.

III. Recommendations in reference to Article III. of the Constitution, so as to remove the name of the Financial Secretary from the Executive Committee. This Article as amended to read as follows:

Article III. Officers.—"Its officers shall consist of a President, First Vice-President-at-large, and a Vice-President from each state as represented, Recording Secretary, Treasurer, Financial Secretary, and an Executive Committee. The Executive Committee shall consist of President, First Vice-President, Secretary, Treasurer, the retiring President, and five delegates-at-large. The President shall be chairman of this Executive Committee. Approved.

IV. The matter of the request of Mr. Remick for remuneration for his services as Financial Secretary for 1890, we submit to this Convention for consideration.

V. The matter of the National Executive Committee appropriating $1,000 to meet

the expenses of the annual conventions is not approved, as the Executive Committee have already the power to defray the expenses of the National Organization.

VI. To amend Article IV. of the Constitution, so that all ex-Presidents of the National Association of Plumbers be declared delegates-at-large, and entitled to all the privileges of a delegate while in convention so long as they remain in good standing in their Local and State Associations. Article IV. as amended, will read as follows:

ARTICLE IV. National Convention.—The National Convention shall consist of representatives from local associations, one for every ten members or fractional part thereof, where such associations exist, who shall be elected at or before the first meeting in May of each year, and the president of each association to be a member by virtue of his office; and all ex-presidents of the National Association shall be delegates at large so long as they remain in good standing in their local associations. Approved.

VII. We make no report, since on this question the subject matter has been disposed of in the report of the committee on resolutions.

National Association of Master Plumbers.

GENTLEMEN: We desire to call your attention to Article II. of the Constitution and By-Laws governing the National Association of Master Plumbers of the United States.

ARTICLE II. Objects.—This association is organized for sanitary, commercial, and social purposes, and has for its special objects the advancement of the trade in all the latest discoveries of science appertaining to sanitary laws; to promote and combine the intelligence and influence of members for the protection of the trade against imposition, injustice, or encroachments upon our common rights or interests; encouraging inventions and improvements in sanitary appliances; fostering an interchange of thought, and eliciting and communicating for the benefit of each member, the best talent and the result of the experience and ability of all, therefore,

Be it Resolved, That plumbers regularly engaged in the plumbing trade, and manufacturing goods of their own invention, and selling such goods only are not defined or classed as "Wholesale Dealers in Plumbers' Supplies."

Resolved, That plumbers regularly engaged in the plumbing trade, receiving letters patent on sanitary appliances of their own invention, and manufacturing said appliances, or causing them to be manufactured, receive our patronage and aid.

Resolved, That plumbers regularly engaged in the plumbing trade, and selling and dealing in plumbers' supplies at wholesale or retail, wholly or in part, goods not f their own invention, are classed as "Wholesale Dealers in Plumbers' Supplies."

Resolved, That plumbers regularly engaged in the plumbing trade, selling and dealing in plumbers' supplies at wholesale and retail, are acting in a double capacity and are unfair competitors, and are not deserving of our patronage.

Approved. JOHN TRAINOR.
J. J. WADE.
DANIEL G. FINNERTY.

Secretary Renick was allowed $150.00 for services rendered last year.

The Convention adjourned till 2:30 o'clock, at which time the election of officers was to be taken up as the first thing in order.

THURSDAY AFTERNOON SESSION.

The convention was called to order by President Griffith. The roll call showed a quorum present. The Pittsburg delegation presented a history of the Pittsburg strike. It was resolved that the president of the National Association who should be presiding at the time, go as a delegate from this association to the next meeting of the American Public Health Association.

On motion the action of the convention on Wednesday afternoon in recommending the name of Mr. A. W. Murray to the directors of the World's Fair as chief of sanitary exhibits, was reconsidered. After considerable discussion, several motions and amendments, it was decided that the convention then proceed by ballot to elect a man to be presented for that position. Messrs. Trainor and Macdonald were appointed tellers. The result of the ballot stood: Andrew Young, 106; A. W. Murray, 52; Robert Griffith, 12; E. J. Hannan, 6; John Trainor, 1. The president announced the name of Andrew Young as the choice of the convention for the position of chief of sanitary exhibit at the World's Fair.

The following resolutions from Pittsburg were reported back from the committee on resolutions and referred to the incoming Executive Committee:

PITTSBURG RESOLUTIONS.

CINCINNATI, June 25th, 1891.

To the President and Members of the N. A. M. P.

Your Committee on Resolutions respectfully report and recommend that the accompanying resolution be referred to the incoming Executive Committee for their favorable consideration.

Very respectfully, WM. H. ROTHROCK,
JAMES G. WELDON,
DANIEL SHANNON,
THOMAS C. BOYD.

Mr. President and Gentlemen of the Convention:

WHEREAS, I have been requested by the Master P. A. of Pittsburg, Allegheny and vicinity, through its delegates to give you a little information relative to the strike now going on there, and if possible suggest a remedy. This strike is neither a question of hours or wages, but simply a refusal to work under the rules adopted by M. P. A. For the past six or eight years Journeymen Plumbers Union have compelled us to submit to their dictation in almost everything but the paying of wages and bills, and we have actually been the foot ball of our employes. We scarcely recovered from one kick when another and more vigorous was applied. There comes a time however, when forbearance ceases to be a virtue, and we the M. P. of P. A. & V. (numbering 110) have at last buckled on our armor and stand to-day as we have for nearly seven weeks, unflinching and more than ever determined to win. You all know more or less of the troubles brought about by the ill-advised tyranny of Trades' Unions, and the Journeymen's Plumbers Union in Pittsburg is, or has been, without a parallel (unless it be Milwaukee) in its connection and dictations. For years past a committee of three have run my business, and so unreasonable did they become that it was more than I dared to tell a man he did not do an honest day's work. They came to their jobs and went from same almost as they pleased. The frequency of those strikes all over the country led me to wonder if it were not possible to draft equitable, honorable shop rules and have them endorsed by this national body. If that can be done, and I see no reason why, endless trouble would be averted. The journeymen who journeyed would find tacked on the shop walls in San Francisco the same rules he had worked under in New Yerk, and he would know that he would be paid according to his ability and no maximum or minimum scale would assist him. We have used all honorable means to break this strike by bringing men from other cities, and I am happy to state that in a short time victory will be ours.

Through the kindness of the Plumbers' Trade Journal you can find a correct copy of Pittsburg shop rules, printed therein, and many have been spread on the seats in this hall. Your time is too valuable to be taken up with long-winded remarks and I will now come to the point, and offer the following resolution: That those rules be referred to your Resolution Committee who shall report as soon as possible to this body.

RULES FOR GOVERNING EMPLOYEES.

1st. From this date you shall be paid by the hour, and nine hours shall constitute one day's work.

2d. You shall be paid according to your ability, and he who is most profitable and faithful shall receive the highest reward in wages, not less than 28 cents per hour in any case.

3d. You must be ready to go to work in shop or on job at 7:30 A. M., sharp, and continue faithfully till 12 o'clock, noon, and from 12:30 until 5 P. M. Any time lost by not commencing work promptly or by idling same away, or by quitting before proper time without permission, will be deducted from your wages.

4th. Special arrangements must be made with employer when work is at a great distance from shop.

5th. When requiring material you must give helper a plainly written order for same, and on no account accompany him to shop, unless you cannot proceed without it.

6th. Blank books will be furnished on which you shall keep accurate account of all material and time consumed on job.

7th. All work when completed must be reported to office at once, and all material must be returned to shop or put in a safe place, and a list of same given at office.

8th. Weekly time slips will be furnished and must be carefully filled and handed to bookkeeper Friday evening or Saturday before 7:30 a. m.

9th. If you desire to lay off, notice must be given foreman.

10th. Overtime will be paid as time and one-half, double time only on Saturday after 4 P. M., Sundays and legal holidays.

11th. Overtime not reported on or before Saturday of the week in which time is made will not be paid until the following week.

12th. Do your work with promptness and dispatch, using good judgment; no carelessness will be allowed. Any time or money spent doing work over, that was improperly done, also any deductions from bills caused by the negligence or carelessness of any workman, will upon sufficient proof after carefully examining the facts, giving the workman the benefit of the doubt, be deducted from his wages.

13th. You are requested to carefully examine all earthenware, glassware, etc., you may be required to handle in your work, and

on completion of job will request householder or owner to examine same, and satisfy them that it is perfect, as you will be held responsible for breakage to the extent of the net cost of the articles, and also any damage done to ceilings, walls or other property, not made necessary by work to be done, must be paid for at net cost of same.

14th. Smoking during working hours will not be permitted, and no gentleman will use profane or obscene language habitually.

15th. You will be expected to teach your helper practically and theoretically, and words of encouragement will do more to create good feeling than curses and scolding. Ever remember you were once in their position, and educate them in your important trade just as you yourselves desired to be educated when serving your apprenticeship.

16th. You will be required to furnish and keep in proper order the following tools for your own use: one tool bag, one furnace, one metal pot, one ladle, one tap bore, one large turn pin, one small turn pin, one set 1-inch, 1¼-inch drift plugs, one soldering iron or bolt, one shave hook, one bending pin, one set of benders, one rasp, one file, one soil cup and brush, one rosin can and grease box, one chipping knife, one set calking irons, one large hammer, one small hammer, one long cold chisel, two short cold chisels, wiping clothes, wood chisels, wood gouges, one brace and bits, one campass saw, one monkey wrench, one set brass pipe wrenches, one large Stilson, one small Stilson, one pair large plyers, one pair small plyers, one screw-driver, one basin wrench, one dresser, one long gimlet.

GASFITTERS' TOOLS.

Two pairs Brown No. 1 tongs, one pair Brown or Stilson 1½-inch, one pair Brown or Stilson No. 2-inch, one Stilson wrench, one pair large plyers, one pair small plyers, one screw driver, one brace and augurs, one long cold chisel, two short cold chisels, one diamond point, one long gimlet, one compass saw, one hand saw, one large hammer, one small hammer, one floor chisel, one gouge, three wood chisels, one alcoholic torch, one blow pipe.

RULES GOVERNING APPRENTICES.

1st. You must get to shop or on job every morning in time to have men's tools ready for them to start work at 7:30 A. M., sharp.

2d. When your journeyman requires material from shop, you must bring written order for same, either after 5 P. M. or early in the morning so that you will get to job at 7:30 A. M.

3d. Must be careful to keep cuttings of lead pipe shavings, pieces of solder, putty, cement, plaster, etc., in a safe place on job, and when done with bring back to shop at first opportunity.

4th. Must be respectful, clean and neat, and avoid using profane and indecent language; smoking strictly prohibited during working hours.

5th. Must not idle your time away, do all in your power to help the journeymen you are with; anticipating his wants by getting ready his solder, etc.

6th. Excepting holidays, lost time must be made up at end of each year.

7th. A full kit of tools will be loaned to each apprentice when he ceases to be a helper.

The following resolution was adopted by the association:

"No plumber shall be permitted to stop work on account of non-union men in other branches of the building business who are employed on the same building or work."

The following officers were elected for the ensuing year:

President, Joseph A. Macdonald, of New York.

Vice-President, Jeremiah Sheehan, of St. Louis.

Recording Secretary, M. J. McDermott, of New York.

Treasurer, W. E. Goodman, of Milwaukee.

Financial Secretary, Thos. J. Tute, of Boston.

Executive Committee.—John Trainor, Baltimore; Wm. McCoach, Philadelphia; C. J. Prescott, Topeka; W. J. Freaney, St. Paul; J. A. Harris, Sioux City, Ia.

Legislative Committee.—James Madden, Ft. Wayne, Ind.; Alexander Crawford, Evansville, Ind.; Charles Anaeshensell, Indianapolis, Ind.; Peter J. Gall, Indianapolis, Ind.; James Healey, Indianapolis, Ind.

State Vice-Presidents.—Colorado, Joseph P. Ratican, Denver; District of Columbia, Donald S. Williamson, Washington; California, E. L. Burgoin, Los Angeles; Rhode Island, Geo. R. Phillips, Providence; Illinois, Wm. Bowden, Chicago; Indiana, James H. Healey, Indianapolis, Ind.; Iowa, J. H. Harris, Sioux City; Kansas, James Foley, Leavenworth; Maryland, D. N. Sullivan, Baltimore; Missouri, John F. Reardon, Baltimore; Massachusetts, Dennis A. Horgan, Boston; Nebraska, J. H. O'Neil; New York, J. A. Creelman, Rochester; Ohio, D. M. Kelly, Columbus; Oregon, Wm. Muirhead, Portland; Pennsylvania, B. F. Call, Pittsburg; Tennessee, J. L. Park, Nashville; Texas, D. L. Sullivan, Dallis; Wisconsin, E. T. Doyan, Milwaukee; Utah, J. J. Farrell, Salt Lake City; West Virginia, C. H. Turner, Parkersburg; Virginia, W. E. Foster, Norfolk.

The President was empowered to fill all vancancies.

It was decided to hold the next meeting at Washington, D. C.

After appropriate thanks for the many kindnesses and courtesies shown by the people of Cincinnati, and a parting admonition by T. C. Boyd to stand by the Baltimore resolutions, the Ninth Annual Convention of Master Plumbers adjourned.

THE Ninth Annual Convention of the National Association of Master Plumbers, to which we give space in this issue, was a pronounced success in every particular. The report will show that a vast amount of important business was transacted, and that the association is in a flourishing condition. The convention was conducted in an orderly, business manner, and the attendance showed the growth of the past year. The reports will be found complete and to them the reader is referred. They speak for themselves and need no comments.

THERE is one thing that can be said of the master plumbers: They have no half-hearted business about anything they do. Everything is done in first-class style.

THE soda fountain was patronized more than the bar.

THE election of officers was fortunate in placing the right men in the right place.

MR. W. E. GOODMAN thought he was "thunder struck" when he was elected Treasurer. Well, it was an awful good strike for the association.

THERE were able men in the convention. A list of them would be too long to publish.

THERE never was a more gentlemanly, orderly convention assembled. Both in the hall and out the conduct of the delegates was irreproachable.

THE visiting ladies were well taken care of by the Cincinnati ladies. In fact Cincinnati did the proper thing all around.

THE ladies visited the convention Thursday afternoon and from the balcony scattered a few flowers to the delegates below. One big bouquet found its way to Vice-President elect Sheehan and was duly appreciated. The delegates were hard at work. It was warm, and many coats were off, but when the ladies appeared on went coats and up went the convention on its feet. Several speeches were made to the fair visitors, and they were shown that their visit was highly appreciated.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

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ANY careful reader or observer will recognize that the National Association of Master Plumbers has discharged every obligation to the public it took upon itself. Many people think that this association aims to benefit its members only, but a glance of the work accomplished will show that the public welfare has at all times received first attention.

THE present is a favorable time for local associations to begin work for the advancement of commercial prosperity among their members. They have well earned some consideration for themselves, and it will be well for them to discharge the duties they owe to their individual members.

THERE are some states in which local associations are not organized to the extent they should be. We hope to see these brought into the fold by the next convention.

IT was long ago demonstrated that the National Association was a success and that it had come to stay. Every convention is another demonstration of its public usefulness.

HAVING received protection through the National Association, the master plumbers of the country should now protect one another in the matter of maintaining prices.

THE plumber is worthy of his hire; his labors are recognized as being important in their relation to public health, and he should not lower his standard by placing a low estimate on his work.

IN this issue the report of the convention is completed, the reports of the State Vice-Presidents being given in full. This completes the record of the convention, and gives those who were not in attendance a full knowledge of the business transacted, and an understanding of the work that was done the past year. We have given the official reports, resolutions, etc., in full, for they are valuable for reference and of interest to the trade in general. There is another reason why so full an account of the convention is given: Besides being well worth substantial record, it is made as complete as it is because THE SANITARY NEWS has a good circulation among interested readers who are not plumbers, and it is of interest to the plumbers to let the public know somewhat of the important business transacted, that it may recognize and appreciate the plumbers' work in relation to the public good. Plumbers themselves understand this well enough, but to make it of the most value to them, it is important that the public also should know it. That this great work should be duly appreciated it must be made known and this is one reason why we deem it important that adequate space should be given it. It is through that portion of the press which is allied with the plumbing interests that the public is reached and through which the important work of plumbers is made known. It is also important that the claims which the plumbers have justly put forth be maintained by the publication of transactions which prove that these claims have been carried out in the work so fully accomplished. We feel assured that those of our readers who are not plumbers will greatly value this and the two preceding issues of this journal, and we are equally sure that the information contained in these three issues will greatly aid in the advancement of the cause in the judgment and favor of the public. It will be seen most clearly that the members of the National Association of Master Plumbers have not been actuated by selfish motives nor have they worked for personal benefits wholly. Their efforts have most largely been directed toward reforms and improvements in the art of plumbing which are of direct benefit to the public. The last three issues of THE SANITARY NEWS, which reached a wide circle of readers, establish the fact that the members of this association have done vastly more for the public than for themselves. Deeming this of great importance to the plumbing interests we have given it the space we have devoted to it as the best means by which it could be brought to public notice. We have already received evidence that our efforts have been appreciated and that the objects we had in view have been attained. A history of the National Association has for the first time been placed before the public, and it is one of which every plumber in the country may well be proud.

THE NINTH ANNUAL CONVENTION OF THE MASTER PLUMBERS OF THE UNITED STATES.

(Continued from page 88.)

REPORTS OF STATE VICE-PRESIDENTS.

ILLINOIS.

To the President, Officers and Members of the National Association of Master Plumbers of United States.

GENTLEMEN: As State Vice-President of Illinois, I respectfully submit my report of what has been done during this year.

After my return to Chicago from attending the National Convention at Denver, Colorado, I issued 250 circular letters and sent one to every town in Illinois where there was a plumbing shop, urging the plumbers to organize associations among themselves and where this was not practicable inviting them to become members of the National Association of Master Plumbers.

I received several letters in answer to my circular, thanking the National Association for the interest manifested in their welfare and they hoped that some day they would be able to join in Local, State and National work for the advancement of the plumber and plumbings work.

There has been no call for my service from any town in this state to assist in organizing associations. I am satisfied that if a great deal is to be accomplished by the State Vice-Presidents, it must be done upon the field and by men whose whole souls are in the work.

The whole State of Illinois is represented almost solely by the Chicago Association, which is in itself a "Tower of Strength;" from its struggles, these towns and cities reap a benefit in many ways. These plumbers are protected more or less in the purchase of their material, since the manufacturers as a rule regard the "Baltimore Resolutions" as binding upon them, and are regulated in the sale of plumbers goods and draw the line between those legitimately engaged in the business and those who are not. The person legitimately engaged in the plumbing business may belong to an association or he may not. The non-affiliated plumber is protected by the safeguard of the National Association to the same extent as the affiliated plumber, while this may seem like unjust philanthropy, still the fact remains that it would be impracticable for dealers to distinguish at all times which of their customers are affiliated and which are not.

When enforcing the penalty for any violation of the "Baltimore Resolutions," it becomes our duty to use a great deal of caution as our own members may be sufferers thereby. It frequently happens that the plumber is indebted to the supply house for goods purchased and he is, therefore, in their power and cannot immediately withdraw his patronage. Notwithstanding all this, every member of a Master Plumbers' Association should be prepared to make a stand for his rights, especially when their interests have been disregarded; and one of the objects of the National Association is to hear and consider all questions and grievances in relation to such matters brought before it.

The condition of the trade between the manufacturers and Master Plumbers of the State of Illinois and especially in Chicago has been of the most friendly nature excepting in one particular case where one supply house has insisted in selling to a hardware house in opposition to their agreement with the Master Plumbers of the United States. We have attempted at various times to have all differences in dispute amicably settled, but we have failed in our attempts.

We feel that in reporting the differences existing between the dealers and the Master Plumbers that we are only doing it as a last resort and with no intention to injure any one, but for the purpose of stimulating other manufacturers in the continuance of their efforts in upholding the fundamantal principles of the "Baltimore Resolutions."

It is with considerable feeling of sadness that I have to report to you that the Chicago and National Association have lost two valuable members in the death of Martin Moylan and William Wilson, their lives stand out as instances of usefulness and will long be remembered by us all.

Respectfully submitted, DAVID J. WHITEFORD,
State Vice-President, Illinois, N. A. M. P.

SOUTH CAROLINA.

To the National Association of Master Plumbers.

MR. PRESIDENT AND GENTLEMEN: As State Vice-President of the State of South Carolina for a part of the year 1891, I make this my report:

On the visit of our president to Charleston, December 16th, 1890, to the National Health Association Convention, he called together the plumbers of this city and explained the working and benefits to be derived from such association, and the gentlemen present decided to form a local association with twelve members, and at a meeting of the said association held February 24th, 1891, passed a resolution that we join the National Association.

On April 13th, 1891, I visited Columbia, South Carolina, the next city in size, called on all the plumbers in the town, and had a meeting the next day. They decided at once to form an association and join the National Association of Master Plumbers, with five shops, which are all in the city.

And here let me add that the harvest is ripe for association work in the South, and am sure that with a visit of some gentlemen of this association there would be a large increase, as little is accomplished by writing to a plumber in a city because they will not approach another on the subject, whereas an outside party would accomplish more in one hour than a local man in a year.

Trade has been very dull with us this year in comparison with the last, but as the season advances we hope for better times, and I sincerely hope that in a year hence, when my successor makes his report from this state, he will report better and greater things. Fraternally yours, OSCAR S. MISCALLY,
June 23d, 1891. State Vice-President for South Carolina.

DISTRICT OF COLUMBIA.

WASHINGTON, D. C., June 20th, 1891.

To the Officers and Members of the National Association of Master Plumbers of the United States.

GENTLEMEN: I have the honor to herewith submit my report as Vice-President for the District of Columbia, for the term ending June 23d, 1891.

During the past year there has been very little change since the previous report. Everything has been moving along as harmoniously as possible.

Our local organization is as strong as ever, and doing all in its power to obtain the passage of Senate Bill No. 11, authorizing the Commissioners of the District of Columbia to make rules and regulations governing plumbing in the District.

The class of work here has been improving all the time until it has reached the point where it can favorably compare with any in the country.

The supply houses here, who signed the Baltimore resolutions, as far as can be ascertained, are still keeping to them, and there seems to be a better feeling between all concerned than has heretofore existed.

Respectfully submitted, JAMES LOCKHEAD,
Vice-President for the District of Columbia.

KANSAS.

Report of the V. P. of the K. M. P. A. to the National Aseociation of Master Plumbers of the United States.

MR. PRESIDENT AND BROTHER PLUMBERS: It is with pleasure that I, as Vice-President of the Kansas Master Plumbers' Asssociation, submit to you my report. So thoroughly are we organized that it is in honor only that I realize the fact that I am vice-president, as the sun has shone so bright on the organization of the Sun-Flower state, that all our brother plumbers have taken up their abode in the protecting arms of the association, thereby leaving no work for the vice-president.

Our business-relations with the wholesale houses have been of a peaceable and friendly nature. We have but one cloud in our western sky and that comes from a "sore-side non-mechanic" (from which source a greater part of our trouble always does come) from the fact that men of our craft refuse to be dictated to by him, and also absolutely refused to bid on work in competition with his "skin labor," he therefore came to the conclusion that $25,000 would be a just recompense for the insult, so he took it upon himself and sued the members of one of our local associations for the above amount which they agreed to pay providing he would discount it 100 per cent for cash and pay the costs; aside from this the Kansas State Association has no other cloud hanging over her, and this is treated as a mere joke, but when the time approaches for the tenth annual report, she will have plucked this thorn from her side never to return, leaving the association as clean and spotless as the immaculate shirt front of a Cincinnati dude. Our motto is protection to our craft and good health to our people. Yours truly, THOS. LLOYD,
S. V. P. N. A. M. P.

TENNESSEE.

NASHVILLE, Tenn., June 22d, 1891.

Robt. Griffith, President N. A. M. P., Cincinnati, Ohio.

As Vice-President for the state of Tennessee, I submit to you the following report of our association in this state for the year ending June, 1891. Our association here is still in a prosperous condition, and so far as I can learn of the other cities in the state everything is working harmoniously. The volume of trade in the past year is as good as we might expect and everything between the jobbing trade and ourselves is entirely satisfactory. No one as I am aware of has violated any of the Baltimore Resolutions. Our association will be represented with you again as well as several of the other cities in the state.

Trusting there will be a full attendance at the convention and with best wishes for the future success of the National Association, I remain,

Fraternally yours, T. J. MOONEY,
Vice-President N. A. M. P.

NEBRASKA.

LINCOLN, Neb., June 19th, 1891.

To the National Association of Master Plumbers of U. S. A.

MR. PRESIDENT AND GENTLEMEN: Having the honor of being your Vice-President for the State of Nebraska, I submit to you the following report, viz: The Master Plumbers of Nebraska have not shown the interest in either the National or the State Association, during the past year, that should have been shown.

Enlightened as they are to the benefits to be derived from our association, it seems to me they have acted very unwisely. True, we have had no very serious difficulties in the state during the year, and practically nothing to call our association into action, yet from experiences in the past, and probabilities in the future, there should not have been the lack of co-operation among the members of our craft that there has been.

If the master plumbers throughout the state were engaged in the business for its advancement, elevation and protection, as they should be, it seems to me they could hardly overlook a thing so vastly important and of such absolute necessity to our future prosperity as this, our association.

I have written to every master plumber in the state, excepting probably a few in Omaha, sending them circulars and beseeching them to become members of our State and National Association and attend our conventions, and asking a correspondence with them, with the very poor encouragement of one answer. I have also written to a number, asking when I might call upon them in the interest of our association, with no better encouragement, and while it may seem I am a little severe in my report, yet it is a true statement of affairs as they exist.

In conclusion, Mr. President, it affords me great pleasure to thank our National Association for the honor bestowed upon me, and I sincerely hope that the report made for Nebraska at our next convention may be of a very different nature from the above, and may show the Nebraska masters awakened to their duty to our National Association. Yours truly, JAMES H. O'NEIL.

MASSACHUSETTS.

To the Officers and Members of the National Association of Master Plumbers of the United States.

GENTLEMEN: As State Vice-President for Massachusetts, I beg leave to submit my second annual report.

I am pleased to be able to state that we have made substantial progress and strengthened our position in this section of our country.

It was a source of disappointment to our members that we did not receive an official visit from the Eastern Contingent of the National Association, during the interval between the Denver and the Cincinnati conventions. It is probable unforseen circumstances prevented carrying out the good intentions of our National Lieutenant; hence, we were once more thrown on our own resources, and after a deal of correspondence with poor results, we determined to visit some of the principal towns and make a personal canvass of the same.

In furtherance of this plan, we first made a descent on Worcester (the heart of the commonwealth), visited the shops and brought some of the masters together, and after a pleasant interchange of views, they agreed to reorganize and appoint a time for our second visit, with the result that they are now organized on a sound and durable basis and affiliated with the National Association.

We found a similar state of affairs existing at Springfield. After two visits to that city we had the pleasure of reorganizing and bringing them into the National fold.

We next paid our respects to Brockton; and, in the language of Caesar, "we came, we saw, we conquered." Brockon is now one of the National brood.

We visited Lynn on two occasions, and while they have a large local association, made up of master plumbers and master steam and gas fitters, that make steam and gas piping an exclusive business. While these various interests agree to locally pull together, they cannot up to date agree on a National Association. The master steam fitting wing, want to join the National Association of Master Steam Fitters; while the Master Plumbers favor joining the National Association of Master Plumbers. Thus the matter stands; they are fine men, but they are still on the fence.

Our relations with the supply dealers (with one exception) continue pleasant and satisfactory. They show a disposition to be fair, and that the present arrangement is mutually agreeable, though susceptible of improvement.

From present indications in the very near future, all the principal towns in the state will be in affiliation with the National body.

In our tour through Worcester, Haverhill, Springfield, Brockton and Lynn, we were most cordially received, and hospitably entertained by the master plumbers of these cities.

To the working team of the Boston Association—T. J. Tute, W. H. Mitchell, Col. James Tucker, J. F. Davlin, David Smith, Isaac Riley, Geo. Forbes, Henry W. Tombs, D. J. Finnerty, D. J. Horgan and Wm. H. McKinna—I wish to acknowledge the services rendered the cause by these gentlemen accompanying me on my various trips, sometimes sacrificing a whole day of their valuable time, and paying their personal expenses. Such unselfish devotion to the elevation of the craft is well worthy of unstinted praise and emulation. DAN'L SHANNON,

State Vice-President for Massachusetts.

KENTUCKY.

LOUISVILLE, Ky., June 22, 1891.

Mr. Robert Griffith, President of the National Association of Master Plumbers, Chicago, Ill.

SIR:—I take pleasure in herewith handing you my annual report for 1890 and 1891, as State Vice-President of Kentucky.

Many things of interest have occurred here in the past year which I will briefly sketch, as I think it will be interesting to the Association.

Our honored president visited us on his return from the South, with a view of reorganizing our local association. After spending several days with us, he returned home stating that upon his visit to Cincinnati, which would occur shortly, he would then call again upon us.

Upon President Griffith's return he brought with him Messrs. Lyons, of Brooklyn; Macdonald, of New York; Hannan, of Washington; and Reid of Rochester.

Having already arranged with the plumbers of Louisville, quite an interesting meeting was held at the Builders' and Traders' Exchange. The inter-change of opinions and good advice offered by the above named gentlemen (for Kentucky whiskey) soon brought about a feeling of good fellowship, to which we must attribute an organization composed of the principal shops of the city, and bringing to our National Convention a delegation for the first time in several years.

Immediately following this, and after corresponding with President Griffith and the Cincinnati Association, I concluded to visit Covington, Ky., and with the assistance of Messrs. Murphy, McNeil and Dow, appointed a time to meet the Covington plumbers, and am gratified to be able to report the organization of an association there, having for its membership every Master Plumber of Covington. On the same evening of organization, delegates to the National Convention were elected.

I have been in correspondence with plumbers in other sections of the state, but as they have but two or three shops in a place, I have been unable to effect an organization. However, I have cordially invited them to attend the convention individually.

The Journeymen Plumbers and Gas Fitters of this city, having quite a strong organization, notified the Master Plumbers in March, that on May 1st, unless they were granted eight hours work and ten hours pay, all the journeymen would go on a strike. Our Arbitration Committee met them, and after two or three conferences we signed an agreement for twelve months, nine hours constituting a day's work with ten hours pay; both sides being satisfied with this arrangement, and all work is progressing nicely.

Again thanking our president and the gentlemen of the Executive Committee, who were good enough to give us their valued time, I remain with thanks for your kind attention. Fraternally yours,

SIMON SIMHAFER,

State Vice-President of Ky.

MISSOURI.

CHICAGO, June 20th, 1891.

To the National Association of Master Plumbers of the United States, Cincinnati, Ohio.

MR. PRESIDENT AND GENTLEMEN: It affords me great pleasure to address this, our Ninth Annual Convention, in behalf of the great State of Missouri, and to extend to you her greetings.

I have corresponded with the local associations in our state in order to make as nearly a correct report of the condition of trade as possible; there is little, if any cause of complaint against the manufacturers or jobbers, and trade in general is in a healthy condition. While some report trade quiet, others report it active and improving; all report a noticeable improvement in the class of work, also that sanitary laws are being adopted in many places, which is a sign of a healthy condition at least.

The public is being educated as well as the plumber, and the time is fast approaching when the agressive, intelligent plumber will be sought for and his services appreciated, instead of being dreaded (especially his bills) as of yore. This improvement is largely due to the noble and well directed work of our National Association, and its worthy officers and committees, who have used their time and energies in this direction, as well as advancing the interests of the National Association in other particulars, and I would be doing an injustice not to mention the noble work that has been done by our trade papers, and when I mention the name of a man like the worthy Mr. Andrew Young, as chief editor of one of these papers, you will agree with me that much good will be accomplished by these journals with such men as their directors. We have great reason to be encouraged with the progress that has been made in sanitary measures, and when we consider the benefits that are being derived from good, practicable plumbing regulations and their proper enforcement, not only to the plumber, but to the public as well, we should take courage and continue to agitate the question until every state, as well as city and town in our glorious country, shall have proper laws governing plumbing.

In the reports from our local associations, with one exception, they complain of low prices, especially on contract work. That exception is St. Joseph, and if she will make known to her fellow craftsmen how she accomplishes such remarkable results, it will be considered a great favor. Surely the man who carries on the plumbing business should be recompensed for his untiring efforts as well as any man on earth; let us continue to agitate this question until we arrive at something that will elevate prices as well as quality of work.

Wishing you a successful and harmonious meeting, and that you may be guided aright in all your deliberations, and with a desire for the continued welfare of our association, I am, Very respectfully yours,

DAVID M. QUAY,

State Vice-President for Mo.

OREGON.

PORTLAND, Oregon, June, 1891.

To the National Association of Master Plumbers of the United States.

MR. PRESIDENT AND GENTLEMEN OF THE CONVENTION: As Vice-President of the State of Oregon, I hereby submit my annual report; this being the only city in our state connected with the National Association, my report will relate to Portland alone. I am glad to say our association is in a very prosperous condition and always adding new members. The prospects for a good season's work are very good, but there being a great deal of competition profits are correspondingly low, as we have quite a number of tinners and other irresponsible and unscrupulous people to figure against, but at the last meeting of the State Legislature an act was passed granting us permission to make plumbing laws which will go into effect as soon as the act becomes a law granting the three cities on either side of the river the power to consolidate as one, which was voted upon and carried at a late election, and then we hope to be better able to protect ourselves against the above mentioned parties. Our relations with manufacturers and dealers in plumbing supplies are satisfactory, and we therefore have no grievances to bring before your convention. I regret that I will be unable to be with you at this meeting, but trust I shall have the pleasure of being with you at some future time.

With best wishes for the succees of our National Association, I am,

Respectfully yours, WILLIAM MUIRHEAD,

State Vice-President for Oregon.

RHODE ISLAND.

PROVIDENCE, R. I., June 19th, 1891.

To the National Association of Master Plumbers of the United States.

GENTLEMEN: It is with regret that I am compelled to report that in Rhode Island the master plumbers seem indifferent to the claim that the National Association has upon each and every plumber in the state, that is, to take an active interest in the affairs of 1st, the local association; 2d, the national organization.

Your state vice-president has labored faithfully and has had the assistance of the best men in the craft, but to no purpose.

I would suggest that an organizer from the National Association be sent to this state in the near future, and pledge him hearty support from the few who are desirous of having a strong association working in sympathy with the National Association.

The relations between the manufacturers and jobbers and the plumbers have for the year just closing been very harmonious.

I trust that before the next annual convention our little state may take that position in the National Association which belongs to her, and which she can easily attain if all would bury their little differences and pull togcther for the common good. Fraternally submitted, WILLIAM L. WHIPPLE,

State Vice-President for Rhode Island.

NEW YORK.

BROOKLYN, N. Y., June 20th, 1891.

To the Officers and Members of the National Association of Master Plumbers of the United States.

GENTLEMEN: As your Vice-President for the State of New York, I would respectfully submit my annual report for the year ending June, 1891.

Since our State Association has been organized, there has been a great amount of good work accomplished; the business transacted at our state conventions greatly assists the local organization in the state and strengthens the National body.

Our State Association was organized on October 17th, 1889, and during the short period of its existence has made rapid progress in all the branches appertaining to trades interest both in sanitary laws and local business affairs.

The third annual convention of the state was held in the Builders' Exchange at Rochester on March 5th, 1891. The meeting opened with President Creelman in the chair and the work of the convention proceeded to the entire satisfaction of the delegates present, which numbered forty with the same number of alternates, representing the following cities through the state: New York, Brooklyn, Rochester, Buffalo, Albany, Syracuse, Batavia, Oswego, Troy, Geneva, Binghampton, Canandaigua.

This large representation of the cities and local associations show the great interest manifested in the state convention and the adavncements of the organization within the short time of its existence.

The officers for the current year were balloted for and the following gentlemen were unanimously elected: For President, W. M. Tobin, of Syracuse; Vice-President, Charles Gieger, of Buffalo; Financial Secretary, C. S. Henchett, of Syracuse; Treasurer, George B. Lewis, of Brooklyn. Delegates at large—George Johnson, of Geneva; Charles Wells, of Troy, and L. P. Beyer, of Buffalo.

There was also an apprenticeship, legislative and sanitary committee appointed.

A resolution which was unanimously carried empowering the delegates to the State Convention to visit cities in their immediate neighborhood and organize new organizations for the purpose of affiliating with the State and National bodies, outstanding cities and towns, which in the opinion of the delegates can be reached much quicker and with better results than the former method, which places all the responsibility on the State Vice-President. This will not release the State Vice-President from the duties laid down by the National Association for him to perform; but it will greatly assist him in the performance of his labors and give strength to the National Association.

The Legislative Committee reported matters of interest and great importance to the state. The paper presented last year which was read at the Denver Convention, and which insures sanitary laws together with strict rules for the performance of plumbing work through the state, was slightly altered and then referred back to the Committee with instructions to push forward the passage of the bill and endeavor to have a favorable report at our next Convention of the state, which will be held in Syracuse.

The appointing of a committee to revise the by-laws of the association and present their report at the next annual convention; the committee consisted of W. M. Tobin, W. G. Reid, and J. C. Sullivan.

The apprenticeship question came up for discussion and a paper was presented and read for the consideration of the delegates; as there was no action taken on the paper read other than to refer the matter to the incoming committee on apprenticeship, with instructions to formulate suitable rules to be submitted to all local organizations through the state for their approval prior to the next state convention, that a suitable apprenticeship law can be reached agreeable to all concerned through the state.

The installation of the new officers was now in order, after which President Tobin gave some very good advice to the delegates and outlined the good done by the state association and the amount of good to be accomplished, and urged the craft to push forward in the good work both for local, state and national bodies.

The meeting then adjourned to meet in 1892 at Syracuse.

I must here mention the cordial manner in which the delegates were received and entertained during their stay in Rochester by the local association. The reception at the banquet hall, which was tendered to the delegates by the local association after the meeting adjourned, was something that will not be forgotten by those present.

At the banquet hall the delegates were welcomed by Mayor Carroll, of Rochester, who spoke at some length on the advancements of sanitary science and he attributed the good health of cities to the sanitary plumbing, together with the good sanitary laws achieved by the plumbing fraternity throughout the state. This with many other remarks from his honor brought forth repeated applause from the delegates.

I am pleased here to state that since our meeting, which was held at Albany, we have organized four new associations to the state and two of which have joined the national association, viz: The city of Batavia and the city of Ogdensburg, and which I presume are represented at this convention. The other two associations which I am in hopes will join the national association, if they have not already made application, are the city of Binghampton and the city of Canandaigua.

I have received reports from a great number of cities and towns in the state, none of which make any complaints, with the exception of the city of Troy, which complains about certain firms engaged in plumbing supplies, which make it a practice to take contracts on jobs of plumbing, furnishing the material and performing the labor. This is very unjust, and I would recommend that something in the way of preventing such injustice to our fellow craftsmen in Troy, and also in any other city or town where such practices are imposed on our local associations or members thereof, to stamp out the evil existing. The manufacturers and jobbers should confine themselves to the business which they have some knowledge of, and let the plumber perform his part, on which he has devoted his many years of skill and practice.

The Master Plumbers' Association of the city of Brooklyn, of which I have the honor to be a member, has within the last year increased its membership double. This large increase of membership and the interest taken in the business of the meetings is due to the harmonious feeling which exists between the members of the association and the manufacturers and jobbers in plumbing supplies in our city, together with the friendly feeling and understanding which exists between the two associations, the Master Plumbers and the Journeymen, which at our convention at Denver, there was a paper read giving the details of this friendly union between the two bodies. There is still another advantage in belonging to our association, and that is the protection members receive against the number of dishonest parties, in the way of protecting their rights in the collecting of just debts. Protection in this way is required in local associations and by such methods your organizations will be strengthened; the National Association will profit thereby and all concerned will derive a benefit, and jsutice will have its sway.

Our sanitary laws are the best that can be obtained both in the cities of New York and Rochester, Brooklyn, Albany, Buffalo and other cities, and when opportunity offers we endeavor to promote and advance sanitary laws and improve our rules and regulations as science advances. With good competent plumbers as inspectors in our health department, and in all other cities and governments where health and sanitary science is required, this will insure the best method of good plumbing and a healthful state of affairs will exist.

And in conclusion I wish to thank my friends in the national, state and local organizations for their friendly feeling toward me and the assistance rendered me in the performance of my duty. Respectfully submitted,

MARTIN FALLON, Vice-Prest. of New York State.

CALIFORNIA.

LOS ANGELES, Cal., June 19th, 1891.

To the Officers and Members of the National Association of Master Plumbers of the United States in convention at Cincinnati, Ohio.

MR. PRESIDENT AND GENTLEMEN: In submitting my report as your Vice-President for the State of California, it is with regret that business engagements preclude me the great pleasure of being with you in convention at Cincinnati.

During the past year two branches of the N. A. M. P. have organized in this state, one in Los Angeles and one in San Francisco, the two largest cities in the state. Los Angeles has a membership of thirty-two, and San Francisco up to last advices had a membership of thirty.

Los Angeles was the first to organize July 2nd, 1890, with five charter members; our roll now includes all the legitimate Master Plumbers of the city.

San Francisco has a sanitary law and a practical plumber for inspector. Los Angeles has the assurance of one soon. The Los Angeles Board of Health has adopted a sanitary law compiled by the local association, which we are promised will be ratified by our city government at once. One of the many benefits already derived from our association lies in the fact that Los Angeles Master Plumbers take no sub-contracts, dealing directly with owners, making estimates directly to the owners, or to the architect; in no case to the contractor. Before we organized, all hands were selling without discrimination to builder, owner or anybody, and at prices as low as to any of the small plumbing shops; a jerry plumber could be employed cheaply (in many instances the carpenter contractor would put in pipes, sinks, etc., himself), so it left little chance for the legitimate shop. This state of affairs has been corrected with the single exception of the Firm of Harper & Reynolds Co., who have up to this time refused to recognize our association, and claim the right, and do sell to any and all whom they please. I consider this a great injustice to us as well as to the other firms who readily signed our resolutions, and whom I believe are acting very nicely in the matter.

Business has been dull here for the past two years, but I believe we have now entered upon a new era of prosperity, therefore it behoves us to stand together to mutually protect our common interests, and to demand our rights from every quarter.

We shall endeavor to bring many more into the fold from our surrounding towns, and I hope when you meet again, you may have a rousing report from California. I am happy to say we are without dissention among our members.

I beg to return thanks to our most worthy president, Mr. Griffith, for his courteous treatment and prompt responces during the past year, and hoping you may each and all have a pleasant, happy and profitable re-union, and deeply regretting I cannot be with you. I am, faithfully and fraternally yours,

W. C. FURREY,
V. P. N. A. M. P. State of California.

WISCONSIN.

To the Officers and Members of the Ninth Annual Convention of the N. A. M. P.

GENTLEMEN: Wisconsin sends you greeting and good wishes. Your representative has the honor to report progress in the advancement of our cause in our state. We have organized the plumbers of Madison, our state capital, and they are now members of your honorable body. In company with sixteen other members of the Milwaukee association I visited Madison, and found the condition of affairs, socially, the same as has existed in all places previous to the organization of an association. They were brought together and a bond of friendship formed and instruction given them which we think will take root and develop into something that will be of benefit to them and us. This is about all that has been done in the matter of organization. Our greatest endeavors have been in the work of legislation, and to that end we bent our energies last winter during the session of the Legislature. Milwaukee tried to have a law enacted requiring the examination and registration of journeymen and master plumbers, but after long and almost successful lobbying we failed. We have not given up the fight yet, and will try it again under, we hope, more favorable conditions. Our City Council also required a little care in local matters, and in this case we were successful. Perfect harmony now reigns in our ranks, and with a united membership and the friendship and good will of our manufacturers, we receive all the protection we can consistently ask. We have passed through another fire (of strike) and like the Phœnix we have risen from the ashes unharmed and more glorious than ever.

We do not expect to do much work in organizing associations, as the plumbers of Wisconsin outside of Milwaukee are few and far between, but we will endeavor to effect such legislation in our state as will redound to our credit and that of the N. A. M. P. of which we have the honor of membership. I have the honor to be,

Yours fraternally, E. T. DOYN,
State Vice-Prest. for Wisconsin.

IOWA.

MR. PRESIDENT AND GENTLEMEN OF THIS CONVENTION: I herewith submit the following report as the Vice-President of the State of Iowa.

Our second annual state convention held in Sioux City, May 7th, and lasting three days was but fairly attended after the effort made by our state and local association.

Des Moines, Davenport, Burlington, Sioux Falls and Sioux City were the only cities represented. Our worthy president, Mr. Robt. Griffith, was also in attendance, and his arguments were interesting and telling to those who had the pleasure of being present.

A communication was read from the Iowa Medical Association, requesting the co-operation of our state and local associations in the research for the betterment of our state and local sanitary conditions, and the prevention of those causes so detrimental to the health of the public. A committee was appointed to confer and co-operate with them.

The following were elected to fill offices for the ensuing term: President, Mr. C. T. Fitts, of Sioux City; Vice-President, Mr. Henry Euringer, of Burlington; Recording and Corresponding Secretary, Mr. J. E. Allen, of Des Moines. Mr. E. H. Walker, of Des Moines, was selected as treasurer, and the auditing committee is composed of Messrs. Wm. Ellemund, D. W. Fitts and J. A. Harris, all of Sioux City.

Our relations with manufacturers and jobbers are harmonious, and but two complaints of a trifling nature were submitted, and those were adjusted to the satisfaction of all.

Our state membership has grown from 29 to 47 in the past year, but the spirit of protection and organization is apparently still a dead letter to those who should take an interest in the work, which has indirectly benefited them, without any effort on their part. I find it an exceptionally difficult matter to impress on certain sections of our state, upon complaining plumbers, the success and benefits derived by being a member of this great Protective Institution, which is reaching out its hand to place them in a more elevated and respected position.

Our local membership has increased from eight to ten members. To inculcate perfect harmony is the unceasing effort of a few but the neglect of the others. It must be said to the credit of our state officers, however, that nothing is left undone to advance the interest and growth of our state and national associations.

After the routine work of the convention was over, a banquet was given in honor of the visiting members and our president at the Merchants' hotel. With our worthy president and Hon. Mayor Palmer at the head of the table, the different courses were interlocked with toasts suitable to the occasion.

Regretting my inability to be present at your deliberations, I remain,

Fraternally yours, WM. ELLEMUND.
Vice-President N. A. M. P. of Iowa.

CONNECTICUT.

BRIDGEPORT, Conn., June 23rd, 1891.

To the National Association of Master Plumbers of the United States:

GENTLEMEN: As your Vice-President for the State of Connecticut, I have very little of interest to report. Our relations with the jobbers and manufacturers seem to be harmonious as I do not know of any complaint having been made the past year.

Employes and employers live in harmony and have no grievances and therefore there is no labor trouble throughout the state.

The master plumbers of New Britain, Conn., have organized a Local Association and are prosperous and happy. They report that their organizing has been a great gain to them and desired to affiliate with the National Association, and I presume are represented in the Ninth Annual Convention. I am sorry that I cannot report any more new local associations from my state, but trust that my successor will be more successful in the future than has been the lot of your humble servant.

We have four (4) local associations in the state thus far and are located as follows:

New London, New Britain, New Haven, and Bridgeport, all of which I believe have sent delegates to represent them in this convention.

If it is proper at this time, I would like to impress upon the officers and members the importance of every master plumber in every hamlet, village, town and city, throughout this broad land, to organize local associations and affiliate with the national body.

I am sorry that I am unable to be with you this year, but trust I may meet you all at some future time, and wishing you God's speed and prosperity, I remain,

Yours fraternally, L. H. MILLS,
State Vice-President for Connecticut.

PENNSYLVANIA.

To the President and Members of the National Association of Master Plumbers of the United States.

GENTLEMEN: At the Eighth Annual Convention of Master Plumbers held at Denver, Colo., one year ago, I had the honor of being elected Vice-President of the State of Pennsylvania. It therefore becomes my duty to report the progress made.

In February of the present year, I had the pleasure of organizing an association in the oil country of our state, consisting of master plumbers of Oil City, Franklin, Meadville and Titusville, making a membership of twelve (12).

I had, during the past week, the pleasure of calling on some of the members of the city of Philadelphia, and they report business fair, and dealings with jobbers and journeymen harmonious.

In the city of Erie there is a lack of enthusiasm, which, to my mind, would be well for our incoming Executive Committee of the National Convention to look after.

In reference to the city of Pittsburg, although we have doubled our membership, and I am happy to be able to say that we have one of the strongest organizations locally in the United States, yet I am sorry to have to state, we have for the past two months had serious trouble with the Journeymen Plumbers' Association, there being a strike for that time, through the adoption of a set of working rules, of which I have no doubt many of you have heard, and by which we as master plumbers want to get control of our business, something that we have not had for some time.

In our dealing with supply houses, with the exception of some slight errors which were satisfactorily explained, we have been working harmoniously.

I will also state that there is a general strike among the workmen of most of the building trades, viz: carpenters, bricklayers and stonemasons; with prospects highly in favor of the master.

In conclusion, I extend to you, one and all, my thanks for the assistance rendered me during my term. With no regrets, except for errors committed, as may have prohibited a complete employmeut of every opportunity of extending its good, I cheerfully surrender for your acceptance, the important trust with which I have been honored. Yours respectfully, B. F. COLL,
State Vice-President of Pennsylvania.

OHIO.

CINCINNATI, O., June 24th, 1891.

To the President and Members of the National Association of Master Plumbers of the United States.

GENTLEMEN: As Vice-President of the State of Ohio, I respectfully beg leave to report that during the past year I have organized an Association in the city of Dayton.

I have also sent communications to Master Plumbers in several cities and towns in the state, with a view as to the formation of a state organization. The local bodies in Cleveland and Columbus are willing, and will do all in their power for the success of the project, but having received no encouragement from the other portions of the state I deemed it advisable to wait until the meeting of the convention when it is hoped that the plumbers of Ohio will make arrangements as to time and place for holding a State Convention.

Our local association is in a very satisfactory condition, having increased our membership by twenty-five, making it nearly double the number of one year ago, and with the prospects of still doing better. Nearly one-half of the licensed plumbers in this city are members, and they represent about eighty per cent. of all plumbing done here.

Our relations with the local dealers is not all that could be desired, but we feel that we are pursuing the proper course, and that before the expiration of another year, we will be able to report our affairs as entirely satisfactory.

Very respectfully, RICHARD MURPHY,
Vice-President for Ohio.

FLORIDA.

JACKSONVILLE, Fla., June 21st, 1891.

Robert Griffith, Esq., President National Association of Master Plumbers of the United States.

DEAR SIR: Since my last report nothing new has occurred to improve the condition of plumbing work in this city as regards the enforcement of the plumbing ordinance. We have no plumbing inspector, and consequently anybody can do plumbing that chooses and in any way. We hope some time in the future to have a plumbing inspector; then (if he is a practical man) we will have better work done, and the occupants of some of our better houses will have better health.

Hoping success to the convention, I remain,

Yours respectfully, WM. CLARKE.

INDIANA.

FORT WAYNE, Indiana, June 20th, 1891.

Officers and Members of the National Associatiou of Master Plumbers of the United States.

GENTLEMEN: At this, the close of my term of office of Vice-President for the State of Indiana, I beg to submit the following report:

Since the last meeting at Denver, Colorado, the formation of local organizations has not been up to my expectations. There has been but one addition to the list of local associations at Evansville, Indiana, which is represented to be in excellent condition, and represented at this convention.

The members of our trade throughout the state are familiar with the advantages of local association and their affiliating with the National Association. While they are slow in forming any local bodies in the principal cities in the state, yet there are strong indications of improvement, and hopes that the state will come to the next convention with more power and less complaint.

A strong effort was made at the last session of the Legislature to secure the passage of a bill for the supervision and inspection of plumbing in cities of 20,000 inhabitants and over. This bill had the support of our best physicians and sanitarians of the state. I had our City Council pass resolutions praying for the passage of the measure, but the opposition was so strong in the Lower House that the bill did not pass.

The plumbers of Indianapolis, through the passage of the City Charter Bill, have secured the legal adoption of a Sanitary Plumbing Law, and an inspector for plumbing. There are strong hopes, however, that the measure which the plumbers of the state presented in the last Legislature will receive proper recognition in the next assembly.

Kindly thanking President Griffith and his administration for cordial and kindly counsel at all times, in the welfare of matters connected with the association in my state during the past year's term of office, I cheerfully surrender the trust with which you have so kindly honored me, and remain,

Very sincerely yours, JAMES MADDEN,
State Vice-President for the State of Indiana.

MARYLAND.

To the President and Members of the Master Plumbers Association of the United States.

MR. PRESIDENT AND GENTLEMEN: I have respectfully to report that the past year has been uneventful in association matters in this state; all, however, being prosperous, and full harmony existing between the master plumber, journeymen and manufacturers and dealers in material. The Baltimore Association, though not great in numbers, is composed of the best material in the trade, who work earnestly and energetically for the benefit of the craft, and to uphold and support the state law and municipal regulations, which it gives me great pleasure to state are beginning to be understood and appreciated by the public. There have been no new prosecutions under the state law, but a very important decision by the associate judges of the high Appellate Court of this state, which fully sustained the law, and commended its wisdom. Deeming this decision may be of interest to your honorable body, I take the liberty of appending a copy of it to this report.

"Judge Robinson filed the opinion in the case of Frank O. Singer vs. State. The appellant, a plumber by trade, was indicted for refusing to comply with the requirements of the Act of 1886, chapter 439, which provides that no person shall engage in the business of plumbing in the City of Baltimore unless such person shall have received from the State Board of Commissioners of Practical Plumbing a certificate as to his competency and qualification. 'The traverser contends,' says the court, 'that this Act is in violation of his constitutional rights under the Fourteenth Amendment of the Constitution of the United States and of the Constitution of this state, both of which declare that no person shall be deprived of his life, liberty and property without due process of law. No one questions,' continued the court, 'the right of every person in this country to follow any legitimate business or occupation he may see fit. This is a privilage open alike to every one. His own labor and the right to use it as a means of livelihood is a right as sacred and as fully protected by the law as any other personal private right. But broad and comprehensive as this right may be, it is subject to the paramount right inherent in every government to impose such restraint and to provide such regulations in regard to the pursuits of life as the public welfare may require. This paramount right rests upon the well-recognized maxim, 'Salus populi est suprema lex,' and whatever difficulty there may be in defining the precise limits and boundaries by which the exercise of this power is to be governed, all agree that laws and regulations necessary for the protection of the health, morals and safety of society are strictly within the legitimate exercise of the police power. If the occu-

pation or calling be of such a character as to require a special course of study, or training, or experience, to qualify one to pursue such occupation or calling with safety to the public interests, no one questions the power of the Legislature to impose such restraints and prescribe such requirements as it may deem proper for the protection of the public against the evils resulting from incapacity and ignorance. The law requires skill in the lawyer, doctor and druggist, and although plumbers may not require the same skill, yet the health of Baltimore largely depends upon the proper and efficient manner in which the plumbing work is done. The Legislature has not only the power to provide a Board to determine the qualifications of plumbers, but it is eminently wise to do so. Judgment affirmed."

The above I submit as my report, and feel that we have been amply repaid for all time and expense incurred in the interest of organization.

Very respectfully submitted. William Dunnett,
State Vice-President for Maryland.

SOCIAL FEATURES OF THE CONVENTION.

It is difficult to say where the social features began which are recorded as a part of the Ninth Annual Convention of Master Plumbers. But the greater part was enjoyed during leisure hours and at times set apart for this feature at Cincinnati. The reception of delegates began Sunday afternoon and continued as long as delegates arrived. The first entertainment was fixed for Wednesday evening when the plumbers with their wives, sisters, aunts, sweethearts, etc., were given a beautiful moonlight excursion on the Ohio in the steamer State of Kansas. It was a genial, merry crowd, and the evening was made most enjoyable with music, refreshments and the enjoyable accompaniments which the plumbers know so well how to provide.

The great day for the delegates and visitors was Friday and it was well named the field day. It was an outing that has never yet been surpassed in any way. There was no evening banquet on the program but an entire day was given up to feasting, music, games, fun-making and solid enjoyment in Woodsdale Island Park. The train left for this beautiful spot at 8:30 A. M., and the picnickers did not return till the cool of the evening. The work of the convention was over and all were care-free enough to give themselves up to the pleasures so bountifully provided for them. The whole park with all it contains was thrown open, and all the games, amusements, etc., designed to lure the nimble nickel from the pockets of the usual visitors were made free to this exceptional crowd. The following prepared program was made the order of the day:

Reception by the Hamilton Juvenile Cadet Corps.

Donkey race, ladies; first prize, silk parasol; second, lace fan.

Donkey race, gentlemen; prize gold-headed cane.

Fat men's race; prize, silver flask (loaded).

Boat race; prize, gold medel.

Puzzle garden race, ladies; first prize, lace fan; second, basket of flowers.

Sack race, gentlemen; first prize, cigar case; second, silver match case.

Swimming race; first prize, gold medal; second, silver match case.

One hundred-yard foot race; first prize, silver shaving mug; second, silver match case.

Base ball game. Eastern men vs. Western men; prize, silk banner.

The program was supplemented to suit the pleasure of the party whose free fancies took a wide range and made the day one long round of continued pleasure. It is possible to mention only a small portion of the many amusements and diversions that made the day so complete, but it was probably one of the most enjoyable occasions ever arranged for the entertainment of a convention.

THE LADIES.

The ladies are never forgotten. The helpmeets of the plumbers are always remembered when there comes a respite from labor. We read of and occasionally observe instances where men congregate at conventions and are wined and dined most selfishly alone, but not so with master plumbers. The sharers of their toil are sharers of their moments of enjoyment, and this feature in the enjoyments arranged was noticeable. The ladies were well provided for while the gentlemen were busy, and at their leisure the ladies had their company and shared the pleasures provided for the attendants at the convention. The visiting ladies were taken in charge by the Cincinnati ladies Monday afternoon, and we briefly note the different entertainments provided for them.

The reception committee for the visiting ladies consisted of Mrs. Thomas McNeil, Mrs. Jas. Gibson, Mrs. Geo. Douglas, Mrs. R. Murphy, Mrs. John Douglas, Mrs. Thos. Hopher, Miss Harrington, Mrs. Thos. Gibson, Mrs. Sullivan, Miss M. Dean, Miss Lawson, Mrs. Nolan and Mrs. W. S. Nock; also Mr. Dean, Mr. L. Gibson, Mr. James Gibson, Sullivan, Wagner and Nolan. Monday afternoon the ladies of Cincinnati met the visiting ladies in the Gibson House parlors. Tuesday afternoon, the Ladies' Committee and visiting ladies visited the Art Museum, an institution that Cincinnati may well be proud of, the Bookwalter collection being a museum of itself. After leaving the Art Museum they visited the Gifts engine house where the gentlemanly captain entertained them by taking them all through the building even on to the lookout, and explained everything as they went from room to room. Then he told Miss Dean to tap the bell and the trained horses were shown. Wednesday morning the Ladies committee and visiting ladies visited the Zoological gardens and before leaving were served with refreshments, after which they took the cars and went to the Music Hall and had a fine jolly time having their pictures taken. They then returned home to prepare for the moonlight excursion on the steamer State of Kansas. On Thursday morning the ladies were driven through the suburbs and shown many places of interest, and served with refreshments at the Shelter House. They returned in time to prepare for the banquet tendered them in the Gibson House parlors by the Gibson House Company in the afternoon. The banquet was not less than what might be expected on such occasions when nothing is done in a half way style. One of the chief objects of interest at this banquet was a large flower piece presented by James Allison representing the plumber's furnace and ladle. It was an excellent piece of work and greatly admired.

Last but not least was the day's outing at Woodsdale Island, one of Cincinnati's beautiful resorts. The Hamilton Juvenile Cadets escorted the party to the grounds which were beautifully decorated for the occasion. "Welcome," in large letters, was placed over the entrance arch composed of flowers. The first thing stumbled over was the foot balls, and one gentleman of Chicago was very sick when he started; he gave a kick at the football, and it is needless to say he forgot he was sick. Everything was to hand to enjoy, swimming, boating, racing, dancing and eating, of which there was plenty—a regular dinner—and the ladies did not have to cook it either. A prize was given for the one who could eat the fastest; the prize was two dishes of ice cream. Mr. Gibson of Cincinnati and Mr. Alcock of Chicago each got two dishes of cream, and their ladies had to go without. There were some very handsome prizes given: Miss Dean of Cincinnati first prize in donkey race, a handsome fan; Mrs. Madden of Sherman, Texas, first prize in second donkey race, a handsome fan; Miss Hay of Boston, puzzle garden prize, a fan; Miss Trainor of New York second, garden prize, a basket of flowers.

The boat race was won by a Rochester gentleman. It was a gold medal; he also won the second prize in the running race and second in the swimming race. The champion swimmer was Mr. Black of Chicago, a gold medal. The silk banner will be contested for next year in Washington; the ball was thrown into the river and another could not be obtained on the grounds. Edison's phonograph was there and every one heard the divorce case of Mr. and Mrs. Brady and enjoyed a "Funny Little Laugh." By request everyone marched from the depot to the Gibson House, headed by the band of music with fireworks all the way. The fire departments all turned out and altogether it ended one of the grandest weeks the plumbers ever enjoyed. Some of the party after starting for home went on an excursion to Louisville; it was a lovely trip after the lively week, dancing, singing and enjoying jokes. Mrs. Mandable was very original; she asked Mrs. Young if she had heard of "the young man that started to swim across the Ohio and when he got about the centre he lost his nerve and was drowned. Some one asked what he went down for. She said she didn't know "unless he went down after his nerve; he likely wanted it with him."

Floating down the river were a lot of logs tied together. One of the ladies asked what they would do with them. Mr. Mandable said they would float them down to some saw mill, take the bark

off and have them sawed. Mrs. Mandable said she thought it would make a great noise. Some one asked why, and she said, "when all those barks go off together." The captain of the steamer was not very slow with his jokes or singing himself.

It will be a very long time before Cincinnati and Cincinnati people will be forgotten by the plumbers.

The Ladies Auxillary Associations of the different cities were represented by the following:

Chicago:—Mrs. J. Hamblin, Mrs. P. Sanders, Miss J. Sanders, Mrs. M. L. Mandable, Mrs. Andrew Young, Mrs. R. Griffith, Mrs. Alcock, Mrs. Chas. Cavanah.

St. Louis:—Mrs. Morris, Mrs. M. Ward, Mrs. Moran, Mrs. Reardon, Mrs. Gerhart, Miss B. Norris.

Pittsburg:—Mrs. B. F. Coll, Mrs. J. Rickets, Mrs. Bradshaw, Mrs. J. W. Tate, Miss E. Weldon, Miss Jas. Hay, Miss Hay.

Boston:—Mrs. Lute, Mrs. Mitchell, Mrs. J. W. French.

New York:—Mrs. Miller, Mrs. Knight, Miss Knight.

Baltimore:—Mrs. J. Trainor.

Bloomington:—Miss Loudon.

Louisville, Ky.:—Mrs. Matlock, Mrs. Simon Shulhafer, Miss Ramsey.

St. Joseph:—Mrs. J. W. Powers.

Rochester:—Mrs. W. G. Reid, Mrs. J. A. Creelman.

Pueblo:—Mrs. W. J. Morgan.

These social features, while they are brief annual respites from the daily round of toil, are not without their important influences in uniting more strongly fraternal ties and in strengthening the bonds of good fellowship. They unite more earnestly the work of the members of the association and promote the harmony of efforts from which success springs.

Mrs. Charles A. Cavanah.

CONVENIENT TO HAVE ABOUT.

In laying zinc avoid nails, and all contact with iron or lime. Allow sufficient play for contraction and expansion, and arrange the drips and falls so as to avoid the necessity of any soldering. It is the best to consult a zinc worker when setting out roofs.

Lead pipes are rapidly corroded by water containing quicklime or blue clay; while sand and carbonate of lime give protection against lead poisoning. Hence it has been suggested that potable water should be caused to pass through a mixture of lime and broken flints before it enters the pipes.

Nothing is better as a tolerable softener of hard water for boilers than adding to it, before it enters, some common tanner's sumach. This can be procured almost anywhere, is very cheap, and remarkably effective in its action on the lime salts. It should not, however, be employed in excess, as it acts slightly upon the substance of the boiler.

In good plumbing there are two all-important requirements. The first is that the strength of the materials shall be sufficient, and the work well executed, as the least defect reveals itself at once by its unpleasant and unhealthful consequences. The second requirement is a due attention to recognized sanitary principles in the general arrangement of the work.

There are many people, even good tradesmen, who are not aware that pure water will absorb metallic lead also pure; yet the fact is incontestable, and may be thus readily proved. Suspend in a bottle of pure water, a strip of freshly cut metallic lead, leave it there for a few weeks, then remove it and test the water by adding a few drops of potassic chromate. The result will be that a yellow precipitate of lead chromate will prove the presence of lead in the water.

An efficient method of cleaning marble is to coat it with a compound of soap lees intermixed with quicklime and brought to the consistency of milk. After twenty-four hours, the whole is washed off with soap and water, and the marble, when dry, is rubbed with fine putty powder and olive oil.

The following is a fine lustrous polish for furniture: Half pint linseed oil, half pint old ale, the white of an egg, one ounce spirits of wine, one ounce of spirits of salts. Shake well before using. A little to be applied to face of soft linen pad and lightly rubbed for a minute or two over the article to be restored, which should be first rubbed off with an old silk handkerchief. It will keep any length of time if well corked.

An expert in such matters says he has found the following the best thing he has tried for making joints against fluid pressure: Five pounds Paris white, five pounds yellow ochre, ten pounds litharge, five pounds red lead, four pounds black oxide manganese. The whole is to be well mixed, and a little asbestos and boiled oil added. This, he says, soon becomes nearly as hard as the iron itself.

A rough estimate of the size of a boiler required to heat by steam a building of a certain size, may be obtained by allowing one square foot of heating surface to each 750 cubic feet of space in the building. This is approximate only, as a great deal depends on the system used, the exposure of the walls, the pressure of the steam, and other things, but with this approximation it will be found that the boiler will do the work with fair economy.

Stroschein, of Berlin, makes liquid bronze by treating dammar resin with about one-third of its weight of carbonate of potassium, stirring for about three days, and then finely powdering the resinous mass. Next it is scattered in thin layers on hurdlers, exposed to a temperature of about 50 deg. C., and left for several months. The resin is then dissolved in benzine or another distillate of naphtha under a boiling point of 150 deg. C., after dry ammonia gas has been led through the solvent. The bronze powder remains suspended in this varnish. Articles bronzed with it are said to retain for years together the original fresh metallic luster.—*Scientific American.*

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

I observe that the Smoke Inspectors of this and other cities are proceeding legally against those who continue the smoke nuisance. This is right and should be sustained by the citizens in every way possible. If there were no means of abating the smoke, or if such means were costly or of such nature as to work a hardship, then it might be indefensible to proeecd hastily against the offender. But happily this is not the case. It has been demonstrated to the satisfaction of intelligent men that smoke can be prevented by processes at hand and economy practiced at the same time. There can be enough smokeless furnaces, smoke preventive and smoke consuming devices, etc., provided right here in Chicago to render every city in the United States free from this easily avoidable nuisance. So when such devices are right at hand, and when their use is of direct benefit to the users, it is just and right that legal means should be employed to compel producers of smoke to comply with the strict letter of the law.

A natural gas expert in an article on the decrease of that fuel states that its use has established the fact that the future fuel will be gas. I do not see that this is necessarily the case. The use of some such gas would solve the smoke problem at once, but at what cost none can yet say. If such a fuel is to take the place of the natural product lying in plenty in our mines, it must be cheaper and more desirable with a constant aud limitless supply. But at present the cheapest fuel nature produces is soft coal, and the present genius of invention is turned toward its consumption in an economic and cleanly way. The near future may and may not produce a fuel undreamed of to-day, but nature has so bountifully supplied us that present thought and enterprise are largely turned toward improved methods of conbustion in its use. Invention and mechanical skill have met the necessities of the times and the problem has been solved. Improvements will go on and new devices will be produced in the development of the principle of perfect combustion.

The enterprise of conducting natural gas from the fields in Indiana to Chicago is again on foot. To what extent this gas will be used as fuel is at present unknown, but it would not seem reasonable that men would go to the expense of providing the means of obtaining and using a fuel of so uncertain a quality. It has stopped at many places; Pittsburg is preparing to relieve that city of smoke consequent on the return to coal, and in Indianapolis the supply has been limited and shut off from certain consumers. It is still a question whether gas can be pumped such a distance, but if it can be, this will not solve the other greater problem of its continued and reliable supply. The cost of this gas has not been made known, but it is believed devices are now at hand which will prove satisfactory in an economic sense and a

sanitary point of view, which will render the use of a fuel of uncertain supply unnecessary.

It has been stated by superficial observers that the virtue of smoke preventing devices was largely found in the careful firing which attended the tests, and that stokers would probably be more careful with such new devices. In the first place the observation is not correct. These tests are given under ordinary circumstances, and the object is to test the device and not the skill in firing. But supposing the remark to be true, does it matter greatly by what means the end is accomplished? One great virtue in tooth powders is the inducement they afford for the use of the brush. If smoke consuming devices induce sufficient carefulness in the fireman to prevent smoke and secure perfect combustion, is the end not well enough accomplished, and does not the virtue lie in the device after all? The truth, however, is that careless firing and its consequent waste and evils called into existence these devices in order that these evils and waste might be remedied, and that they serve this purpose is excuse enough for their being. The enforcement of the law to the extent of securing the use of these devices will prevent the smoke nuisance despite careless stoking, for the stoker will have to become competent to do his work just the same as any mechanic or professional man.

The following letter has been received:

Pittsburg, June 11, 1891.—Andrew Young, Esq.: Will you please give me names and addresses of manufacturers of smoke consuming apparatus in use in your city? Are there any that are adapted to locomotives? Which one in your opinion gives the best service? Respectfully, Jas. F. Fawcett.

[The above letter has received personal attention, and others will do well to consult our advertising columns.]

HOUSEHOLD REFUSE.

The following is taken from an article in engineering on the subject of the disposal of household refuse:

There are 750,000 tons of household refuse produced in London every year, and the vestries are at their wits' ends to know how to dispose of it. There is a tradition that large fortunes were once made by dealing with such waste, and the "golden dustman" has passed into a proverb. But if ever this was the case, it has long ceased to be so. Either the quality of the dust has changed, or the former means of dealing with it have ceased to exist, as now it is a source of expense from first to last, and the object of all concerned in its removal is to get rid of it as rapidly and cheaply as possible.

At one time the "destructor" opened a prospect which was full of hope to the parish officials, and they grasped at the idea of burning up all the foul rubbish, and thus getting rid of it once and for all. But that time has passed. The suggestion of establishing a destructor in a district sets all the inhabitants into arms, and gives rise to an outcry that cannot be resisted. In theory the incineration of refuse is beautiful, and it can be carried out fairly well in practice, so long as the apparatus works under favorable conditions. But somehow a breakdown occurs every now and then, and the stink of burning animal refuse pervades the neighborhood. It is very easy to see how this may occur if the fires are allowed to get into bad condition. The collecting vans come in irregularly; sometimes several may arrive together, and, if the men tip their damp contents one after another into the furnaces, there is a great probability of the fires being checked and a volume of smoke given off that does not get completely consumed by the appliances provided for the purpose. Much of the evil may be due to carelessness or want of management, but whatever may be the cause, the destructor has earned for itself a bad name with the public, and it is almost impossible to establish one within the precincts of a town.

The plan that was formerly adopted of laying the refuse, or "dust" as it is called, in heaps and sorting it by female labor, requires a considerable amount of space and gives rise to nuisance. The contents of the heaps, shut out from air and light, putrefy, and when they are turned over, the stench spreads far beyond the limits of the ground. In small places this method is still pursued, but it is no longer practicable in large towns. Such places seek the readiest way of getting the dust right away. If they have access to the sea, they take it a few miles out and dump it into the water, with the result that a good deal of it floats back and litters, if it does not defile, the shore. The London vestries discharge their vans into barges and send the contents down the river to be laid on the Essex and Kentish marshes. Here there is abundant fresh air and only a spare population, so that no harm is done. In course of time nature disintegrates most of the elements of the heterogeneous mass, and when mixed with the vegetable mould of the marshes it becomes a fairly productive soil.

A cursory inspection of the contents of a dust-cart leads to the idea that they are mostly valueless and wholly offensive, or capable of becoming offensive under the influence of time and heat. But this is a mistake, due to the large bulk of the lighter and more ordurous constituents. Such articles as empty meat tins, bottles, waste paper and straw, and vegetable refuse, make a large bulk, but only weigh very little. Three-fourths of the weight of the dust collected consists of fuel. A proportion of this has never been on the fire, while most of the remainder is good cinder; it has had the gases expelled, but the carbon remains and makes capital fuel. Of course there is some thoroughly burned ash, but it is wonderful how much less than one would expect to find. The modern servant is not addicted to the use of the riddle, and all she finds in the grate in the morning goes into the dustbin. This is well known to those interested in such matters, and the brickmakers consequently absorb many thousands of tons of breeze from the dust-carts annually, to the great annoyance of their neighbors; for, although the amount of animal and vegetable refuse is relatively small, it is usually sufficient to taint all the other elements in the dust, and to render them offensive when burnt or handled.

It has been the object of sanitary reformers to discover a method by which the valuable part of the dust could be thoroughly cleaned and turned to account, and the useless parts destroyed without nuisance. A process devised for this purpose is now to be seen in active operation on the premises of the Refuse Disposal Company, Chelsea. It is the invention of Mr. Joseph Russell and Mr. J. C. Stanley, and its salient feature is that the dust is dealt with immediately it arrives, and that, during the whole time it is under treatment, it is kept in motion, and is fully exposed to the air in thin layers. It is tipped from the cart into the machine, and immediately commences its passage through the various sorting devices. In a few moments it has been divided into its different constituents, while all that is offensive has been intimately ground up with other material, mostly carbon, in which it is not only lost, but deodorized. The breeze and ashes find a ready sale among the brickmakers, but there is still a better outlet for them. By mixing them with pitch they can be pressed into briquettes and used for steam raising. It can scarcely be contended that these briquettes are equal to those made from fresh Welsh coal, but they are very fair, and can be sold at a reasonable price. The liquid pitch incloses any objectionable elements they may contain, and the result is that they are inodorous. Another material of value found among dust is paper. Immense quantities of this are collected, and can be used over again for the manufacture of common brown paper for wrapping parcels. After being dried to remove the dust, and passed through the beaters to reduce it to pulp, it becomes as clean and as sweet as when it came home from the grocer's or draper's. Straw can be similarly utilized for strawboards.

We recently had an opportunity of inspecting the company's premises, and feel sure that a short account of them will interest our readers. It is an important feature of the process that it is almost entirely mechanical, as nine-tenths of the material is never touched by hand. The dust as it arrives is tipped into a rotating cylindrical sieve. This runs on a horizontal axis, and is twelve feet in diameter by twelve feet long. The meshes are formed of bars three inches apart, and the progress of the tailings is regulated by an internal worm, which obliges them to make about three circuits of the screen before they can escape. A large exhaust pipe, operated by a powerful fan, draws all the floating dust and small particles forwards, and delivers them into the closed ashpit of a steam boiler. The tailings are mostly bulky articles; the paper, rags and straw usually roll into balls, although a good deal of small escapes through the meshes. Each thing that comes out is thrown on to its proper heap, while the rubbish for which no use can be found is sent to be ground under edge runners, as will be explained presently.

The articles that pass through the meshes are raised by an ele-

vator, and delivered to a second rotating screen fifteen feet long, six feet in diameter, and an inch and a half mesh. The tailings from this are first subjected to a blast, to take out light paper and straw, and are then dropped on to a revolving sorting table, fifteen feet in diameter. A boy sits beside it, and picks out every thing of value as it passes him, such as bottles, glass, iron, bones, etc. The rubbish, such as animal and vegetable refuse and broken crockery, he allows to go pass him to the grinding mill. Here every thing for which no use can be found is reduced to a dry powder, which appears able to absorb all the offensive elements and render them sweet. There are no heaps labelled "miscellaneous" in these works to distract the manager and breed a nuisance. Every thing that is doubtful goes into the mill, which is the *pot au feu* of the establishment. When it comes out it is no longer recognizable. The mixture is carried back and put into the first screen to be again sorted.

Every thing that will pass through an inch and a half mesh falls from the second screen on to a traveling band, which delivers into a third screen fifteen feet by six feet covered with two meshes, half an inch and three-eighths of an inch. What passes through the former is called ashes, and through the latter breeze. The tails go for steam generating. The ashes are used to mix with clay for brickmaking, and the breeze for burning in the clamps, unless, as indicated above, they are pressed into briquettes, which, of course, fetch a better price. The ashes and breeze pass over a fine shaking-screen, which takes out every thing below an eighth of an inch. This is valuable as manure, being the greater part of the animal and vegetable matter ground up in the mill.

Having traced the dust through its entire passage we must return and notice some of the tailings. As we have already said, every thing for which an immediate use cannot be found is destroyed. At present straw falls into this category, although the success of foreigners in the manufacture of straw-boards leads to the hope that that manufacture may be eventually established here. The straw is all burnt with special precautions to render the smoke offensive. An externally fired cylindrical boiler has two grates; on the larger of these the straw is burned, while on the smaller there is a breeze fire through which the gases from the straw are passed to complete the combustion. The paper is re-made on the premises. This seems a curious industry to carry on in Chelsea, but a well has been sunk into the gravel, and an ample supply of water has been obtained to keep three beaters and one paper machine at work. This is the most valuable by product of all. The special value of the process is, however, that it enables the paper to be cleaned immediately, instead of being retained until a market can be found for it.

The works naturally consume a good deal of steam, particularly for the paper-making, and this accounts for much of the fine fuel. Indeed, it is conceivable that in any general extension of the system it might be worth while to use all the fuel on the premises in winter for the production of elrctric lighting currents. The total cost of handling would thus be avoided, and possibly a saving of the ratepayers' money effected. To prevent the evolution of smoke and any nuisance that might arise from the nature of the fuel, the five boilers of the works have their smoke drawn by an exhaust fan through scrubbers, in which it is thoroughly washed before it is delivered into the air. The three locomotive boilers are worked with forced draught, by which all the floating dust collected from various parts of the works is thoroughly burned up.

The works have already been in operation for nearly two years, and during that time they have grown up to the present state as the results of prolonged experiments, in the course of which five thousand loads have been treated. Difficulties. often quite unexpected, have been found and met, and new devices have had to be produced as time went on. At present the works are dealing with thirty-five loads a day from Kensington and Westminster, parishes, and are on a sufficiently extensive scale to show what the process will do. They are exciting a great amount of attention all over the country, and many parishes are watching them with interest. The disposal of dust is undoubtedly one of the greatest problems of the day, and the process patented by the Refuse Disposal Company solves the question from a sanitary point of view, but of course it would want an examination of their books to decide the exact economic value of the process.

STEAM AND HOT WATER HEATING.

The systems of heating by steam and hot water have each their advocates, and the question of which is the better is one that has not been settled. The matter came up for discussion recently at a gathering of Canadian architects and engineers, and both of these systems were freely discussed. During the discussion Mr. Murry, one of the speakers, took a general view of heating and made the following remarks:

There are so many factors in the question of heating that it is a very difficult question to show which is the better plan by mere statement. As far as I can see, it is impossible to make a fair comparison as between systems; the question has not been solved, and will not be for some time. I think, all things considered, that you must get better value from your fuel passing through the steam boiler than through the hot water boiler. Your boiler is at a higher temperature, and is therefore more likely to burn the gases than in the hot water apparatus. In the latter, in ordinary circumstances, the temperature is not high enough to consume the gases fully, and you consequently must lose that amount of heat value. Then, again, if you burn the fuel and convey it to different parts of the building, why should the one be so much more economical than the other? I will admit that for small houses hot water is more serviceable. For large buildings it is a question that depends very largely on circumstances, and on the person putting in the apparatus. There is no doubt that in a small room with one radiator in it, steam is rather a nuisance unless it can be regulated in some way, and water is very much nicer to heat it; but again you require such a large amount of hot water heating surface that it becomes in many cases a nuisances. You can't have a room full of coils; you want to put some furniture in. What I would like to know is, what has been done in a fair spirit to find out the relative value of the two systems? This question of a man experimenting with a thing to prove what he believes is all a mistake—he generally does prove what he does believe; and so it goes on. I think in this country hot water heating with an indirect system is almost impossible, unless you have a man up day and night who can watch the different dampers and close the heat here and there, and close off the air, and other things. It would be almost impossible to prevent occasional freezing of the pipes, and consequently repairs; whereas with steam it is possible to heat a building on an indirect system very comfortably—far ahead of hot water in my opinion, and with comparatively little care. It has been done, and has given satisfaction; and what has been done can be done again. As to fuel, I know that indirect steam heating requires a large amount, as it necessarily must when you bring in fresh air and warm it up; but you have the advantage of fresh air, whereas with hot water it is the same thing as stoves, heating the old air over and over again, and the amount of air you generally get in from crevices—which generally comes in from the windward side, and is allowed to pass out of the building to the leeward side.

BACK VENT PIPES VS. ANTI-SYPHON TRAPS.

The following is from Leonard D. Hasford in *Architecture and Building:*

It is not my intention, if it were my ability, to discuss exhaustively the merits of either the back vent pipe system or non-siphoning devices, but I take the position that some one in authority and connected with the plumbing bureau of our Health Department, should examine the principle of every plumbing device placed upon the market with a view to its fitness for the position it was designed to fill, and that its merits or demerits should conclusively be proven before its use was approved or rejected.

When an architect presents plans to our Building Department for a projected 2-story frame cottage on a 16-foot lot, it is not required that he shall employ 24-inch brick walls and the foundation of a 10-story office building with iron beams and girders to carry the structure. There is some calculation made of the strain which in extremes will be brought to bear on the walls and floor joists, and if the plan submitted is calculated to withstand such conditions it is approved. This is not so with plumbing work to be constructed therein under the present regime, but for want of absolute knowledge of conditions and devices, a sweeping rule is made to cover every circumstance if possible without regard to expense.

A few years ago some one discovered that under certain conditions the ordinary "S" trap or bent pipe forming a water seal would be siphoned in plumbing practice; thereupon a trap holding a larger quantity of water and calculated to withstand greater siphonic action was placed upon the market in the form of a "bottle trap." Still this did not fill the bill, as a continued strain would finally break the seal in this trap also. About this time our Health Department issued an edict "that all traps must have a vent pipe connecting with the crown of the trap and extending to outer air, either directly or indirectly." This has been religiously adhered to in the construction of new plumbing work in this city for a number of years. No matter whether the trap is subjected in its position to siphonic action or not, it must be vented just the same.

During this period of years in which trap venting has been followed religiously, several inventions have been made in the shape of non-siphoning traps and air vents, which safely and surely prevent trap siphonage where properly adjusted, and at a much less expense than trap venting as at present practiced. But our Health Department seems satisfied to let well enough alone, even though it is in some instances a useless waste of money to enforce the law.

The use of the vent pipe as a preventative of trap siphonage has been uniformly successful when properly applied, but there are undoubtedly many positions where it is superfluous.

After fourteen years' experience in the plumbing industry, I have violated the principles of the New York Health Department by remodeling the plumbing of my own residence, and in several instances omitted trap vent pipes altogether in order to save money, and I have never yet felt that I saved that money at the expense of my family's health. I did this after a study of conditions and a knowledge of the merits of certain sanitary devices, and I doubt much if there is any officer connected with our Health Department, if left to exercise his own free will, would insist on indiscriminate and unconditional vent piping, particularly if he had to pay for it.

There is absolutely no question but that thousands of dollars are unnecessarily spent annually in the construction of plumbing in this and other cities, under the imperative and unconditional trap vent pipe rule. I ask the question, has the Health Department legal power to enforce more than a sanitary condition? And that if such a condition can be produced for $100, can an authority legally demand the expenditure of $200 for the same work and result?

The writer is not adverse to trap vent pipes where they fill the bill better than anything else, as in some instances they do; but when equally favorable results can be secured by the use of some other device, it seems folly to enforce such a waste of money.

What the plumbing trade require at the present moment is a tabulated schedule of conditions established by scientific experiment, proving beyond doubt the value of the vent pipe in various situations, and a thorough test of any and all non-siphoning traps or devices calculated to preserve trap seal.

Such a test, if thorough, would probably cost several thousand dollars, but it would develop actual facts which never have been made public, and it would develop the fact that in some instances a non-siphoning trap is preferable to a vent pipe, and in many instances equally as good.

If Messrs. Putnam, Waring, McClellan and a score of others have meritorious devices, their account should then be credited with the points of merit they deserve, and allowed to use their appliances under conditions where they fill the bill; and in places where they do not stand the test, some other means must be resorted to; but to say that because under certain circumstances an ordinary S-trap is siphoned, therefore every trap must have a vent pipe whether it will siphon or not, seems ludicrous and unreasonable.

We are nearing the time when some one will test the validity of this law and plumb his own building as he may see fit, so long as he provides a safe sanitary condition, which is really all that can be required.

THE usual departments will be found in future issues hereafter. The convention comes but once a year, and its nature is such that it deserves a full report.

PLUMBING NOTES.

The firm of Pennington & Brain, of Windsor, Ont., have completed a job of plumbing in the Fighting Island hotel near Detroit for Messrs. Gillman, Barnes & Co., amounting to $2,500.

The Instantaneous Water Heating Company, of this city, has removed their manufactory to 141 and 143 Ontario street.

Thos. Kelly & Bros., of 75 Jackson street, this city, announce that they will hereafter do no more plumbing, and will sell goods to the plumbing trade only. This is a well known firm and we need not bespeak for them the patronage such an announcement will surely merit.

The Detroit Radiator Company, of Detroit, Mich., have opened a branch office in New York at 78 John street, where a large stock of their radiators will be carried, also a full line of samples of their well-known Detroit Fluted and Detroit Ornamental Fluted Radiators. This branch will be in charge of Messrs. Wells & Coutan Company.

There is one instance of record which gives strong evidence that plumbers are not averse to taking water. This is to be found in the fact that Harry Black, of this city, won the medal as champion in the swimming race at the picnic on Woodsdale Island.

We are in receipt of a catalogue of the Bundy Steam and Hot Water radiators, issued by the A. A. Griffing Iron Company, of Jersey City, N. J. The catalogue is a handsome one of 272 pages, finely illustrated and containing references from all parts of the country. The catalogue is designed for steamfitters and architects, and every steamfitter and architect desiring a copy should send their name and address to the above address with request for a copy.

When it comes to work in a convention, J. J. Wade, of Chicago, is a whole team. In the history and progress of the National Association his name is prominently in the front.

T. C. Boyd can entertain, can amuse, and instruct, and when it comes to making a speech before a convention, he is right in it.

Mr. Hussey, of Omaha, is a quiet, gentlemanly man, and when he gets up before a convention to speak every one present is quiet and gentlemanly.

The following letter addressed to the foreman of Wallace & McNamara, Des Moines, Ia., has drifted into our hands: I learned copper, tin, and sheet iron work, and worked at it for fifteen years, but find now that tinners in small towns have to do some plumbing. I want to know how to make wiped joints on lead pipe. Can you give me general directions so that I can be trying to learn? and when the spring work opens I will go to Des Moines and with your consent go out with you to your work for a few days. Please give what directions you consider best. I will pay you for your time and trouble I may put you to. Hoping to hear from you soon, I am yours, Geo. Brandon, Jefferson, Iowa.

We respectfully refer Mr. Brandon to Mr. Mandeville, Chairman of the Sanitary Committee, Chicago Master Plumbers' Association. We have never heard of a man who had a pair of shoes to make wanting to know how to make a waxed end, but we expect to now soon.

If these manhole explosions don't stop,
Some one will get killed sewer pop.

It happened about this way: As the delegation from Chicago, Milwaukee and some other cities was proceeding to Cincinnati over the Big Four on Sunday, June 21, the same being a very warm day, it so happened that about the middle of the day, which is the noon hour, the usual time for eating, that large delegation as one man became hungry, which, interpreted, means that the boys wanted to eat awful bad. There was no dining car at hand, which necessitated the feeding of the flock from the buffet. One W. E. Goodman who is now the Hon. Treasurer of the National Association, was traveling from the far-famed city of Milwaukee, and in the same coach was his fellow-townsman, Charles Polachek, who is sound of limb and keen of appetite. It came to pass that Goodman had finished his repast and that his fellow-townsman Polachek seated himself where the meal had been, but them was not, for Goodman had devoured it. It was a gay crowd and many had grown bold enough to venture on a song. Now, this same Polachek doth dwell 'mid music's charms betimes, and he had

just finished the line "There is but one more river to cross," when the waitor, recognizing the place where Goodman had rioted among toothsome viands, better than he did the rioter, said "Your bill please," handing same to Polachek, him with the unsatiated appetite. The bill was paid, and as the last river was crossed, the payor rused out at the first station and returned with his arms full of chicken and pie.

Some folks say that tinners don't plumb,
Johnny get your gun, get your gun;
That they monkey 'round and tinker some,
Johnny, get your gun, get your gun.
But they've been caught with kit in hand
Scrimping work throughout the land,
Johnny, get your gun, get your gun.

One of the first rules to remember as an aid to successful business is, don't cut prices. Remember that above all others the plumber is worthy of his hire. He gives value every time he puts in a good job of plumbing at any price within reason. Do good work and get good prices.

An old man sat with shadows dim
Of a life that was nearly spent;
And he blessed the day that had blessed him,
When the plumber put in his vent.

Plumbing Inspector Barrows of the health department has completed his inspection of Chancellor L. Jenks' tenement house at 543 South Clark street and the others in the same block, and reported to Health Commissioner Ware the numerous changes in the plumbing that are required to put the building in proper sanitary condition. The owners will be ordered to make the changes at once.

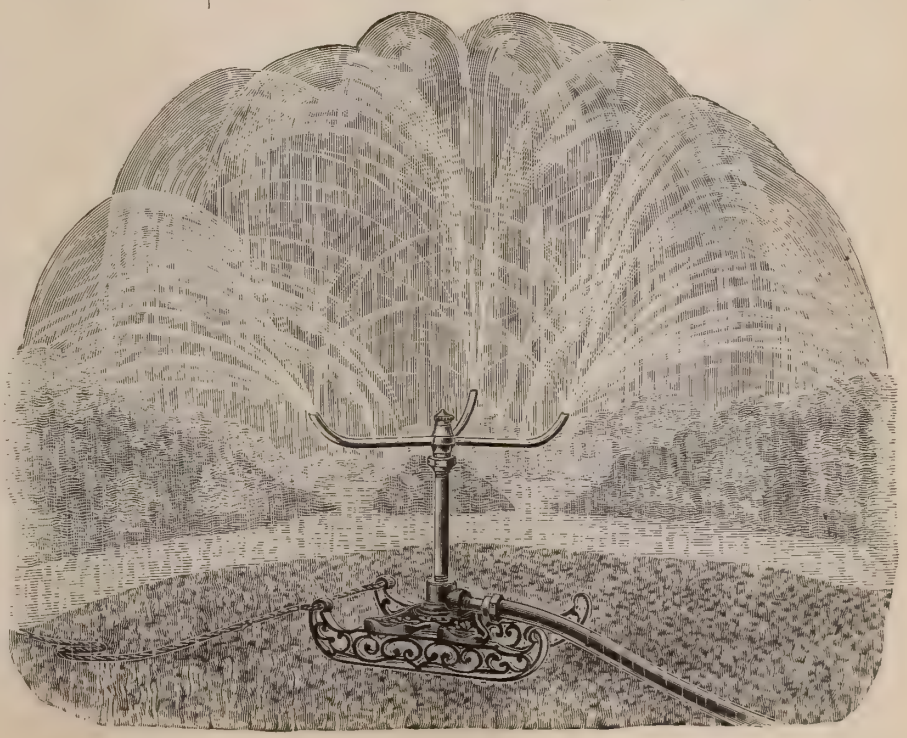
A little germ in the soil pipe grew
Unseen by the sun or wet by the dew.
Happy it was in that sealed soil pipe
With waste joints sealed with a polished wipe,
But the plumber came with his timely vent
And the germ to kingdom come was sent.

The microbes laughed in ghoulish glee
When they saw the tinner come;
For well they knew that the tinner man
Didn't know how to plumb.
But when the skillful plumber came
The microbes sought to flee;
For he set his finished trap and vent—
And hushed was the ghoulish glee.

The public may be a little slow to recognize the value of the purposes accomplished by the National Association, but they will in time appreciate every effort that has been made. They will in time see that the results of all these years of work are the promotion of public health and the advancement of the general welfare.

THE NO. 4 ECLIPSE LAWN SPRINKLER.

The illustration represents the No. 4 Eclipse Lawn Sprinkler in action, now being manufactured by John C. Kupferle, for which a patent has been applied for. It ismade same as his No. 1, which met with such ready sales. The new features being the bottom runners which, it is claimed, are of great convenience wherever the sprinkler is used on large gardens or lawns. It overcomes the necessity of turning water off and on, as it can easily be drawn in any direction by use of a rope or cord, attached to runners. The top swivel and arms are made entirely of brass. Stand pipe is ⅜ inch, painted red. The bottom plate attached to runners, is made of iron, painted green and bronze. The runners are cast iron and japanned, making, the manufacturer insists, the most durable and handsome sprinkler now offered to the trade. It will throw water from 30 to 60 feet, and can be regulated to revolve very rapidly or slowly as desired. Various imitations have been made of the above sprinkler by different factories, which have failed to give the satisfaction desired, but the manufacturer desires to inform the trade that his is the only sprinkler of its kind now on the market which has given entire satisfaction, and as such is guaranteed. For prices and circulars address any of the Plumbing Supply Houses in Chicago. They are manufactured in St. Louis, by John C. Kupferle.



WHERE PLUMBING WORK IS BEING DONE.

828 Attica street, Morris Bros.; 5557 Atlantic ave., W. Bowden; Albany and Twenty-second, Steiner & McFarlane; 5318 Atlantic ave., M. Stack; 5718 Atlantic ave., R. B. Timmerman; 5135 Bishop, Morris Bros.; Belmont ave. and Racine, G. Hauslein; 3139 Butler, Collins & Co.; 2944 Bonfield, Collins & Co.; 1310-20 Burchell, Garner & Bahn; 654 Belmont ave, F. Neustadt; 697 Burling, Reich & Neuberg; 5036 Carpenter, Morris & Bro.; California and Centre, Garner & Bahn; 199-203 Colorado ave., C. E. Jurgens; 500-502 Clybourne ave., F. Neustadt; 5318 Dreyer, Morris Bros.; 1622 Dewey, J. Kenney; Duncan Park west of Wright, M. Stack; 925 Eighteenth, Steiner & McFarlane; 176 Edgewood ave., Garner & Bahn; 646 Fletcher, P. H. McCabe; Fifty-sixth and Emerald ave., A. Schilvers; Fifty-fifth and Sherman, A. Schilvers; Fifty-first bet. May and Centre, Morris Bros.; 90 Fullerton ave., G. Hauslein; 1565 Fillmore, S. Smith; 1459-63 Fillmore, S. Smith; 360 Fullerton ave., J. Schuer; Fisk, Chas. Aher; 721 Forty-sixth, M. Stack; 1020 George, P. Feltman; Goodwin and Ardmore, Wm. Bletch; 131 Huron, G. Hauslein; Humboldt bould. and Shakespeare, G. Hauslein; Hinman and California aves., C. Kostlevy; 993 Hammond, Bayha & Bach; 1398 Harvard, Steiner & McFarlane; 260 Hudson, Brown & Co.; 722 Halsted, Ph. Gunderman; 843 Hoyne ave., P. Feltman; Irving ave., Robt. Griffith; 3835 Indiana ave., J. M. Collins; 583 Kedzie ave., Chas. Uher; 299 and 315 Lee ave., W. and J. Rankin; 29 Lexington ave., T. Robinson; Lincoln and Twenty-second, Steiner & McFarlane; Michigan ave. and Forty-sixth, J. Teutsch; 6804 Morgan, Morris Bros.; 3536 Marshfield ave., Morris Bros.; 43 Menominee, C. Rediske; 88 Mohawk, Fred Neustadt; North ave. and Wood, C. Breyer; Ninety-fifth, W. Johnson; Orchard, Molter & Kretchmer; 246 Ohio, J. J. Hamblin Co.; 563 Orchard, Nash & Harna; 7402 Peoria, Morris Bros.; Polk and Clark, Loughlin; 87 Ruble, F. Tegtmeyer; 97 Reese, F. Neustadt; 4948 School, W. H. Murphy; Selvyn, Robt. Griffith; 4410-12 State, Morris Bros.; Seymour near North ave., J. T. Benburg; 5923 Sangamon, M. Stack; Seventy-third nr. Perry, J. H. Bradley; Sacramento near Jackson, D. Jack; 471 Thirteenth, W. H. Cummins; Thirty-third and Portland, W. H. Kilian; 6804 Throop, Morris & Bro.; Thirty-fourth, Morris & Bro.; Troy and Twelfth, S. Smith; Twenty-second and Fairfield ave., Steiner & McFarlane; 43 Tell Court, J. Denniston; 503 Twenty-eighth, M. Weber; 8 Utica, S. Smith; 5222 Union ave., M. Weber; Vincennes and Sixth-fifth, D. Walsh; 3645 Vermont, Morris & Bro.; Vincent near Fullerton ave., Gay & Culloton; Western ave. near Seventy-first, W. H. Murphy; Wall and Spring Grove, J. Teutsch; 3653 Wentworth ave., J. Teutsch; Wood near Milwaukee ave., Geiss; 3317 Wallace, Morris & Bro.; Winchester ave. and Fiftieth, C. Kostlevy; 3806 Wallace, J. J. Quinn; 359 Washburne ave., Chas. Uher; 63 Wilson, M. Stack; Washington ave. north of Irving Park, Garner & Bahn; Wright near Seventy-fifth, J. H. Bradley.

The following disposition was made of smoke nuisance cases before Justice Prindiville June 23:

E. Burkhardt, fined $5; Siegel, Cooper & Co., $25; C. C. Heiser, L. Z. Leiter, Thomas Huston Co., Chicago Edison & Co., Saratoga Hotel were each fined $10; Kelly Building Co., Cook & McLain, F. G. Logan, Grand Pacific Hotel, Weber Catering Co., Marshal Field & Co., Collins & Burgie, C. & N. W. Elevator, Wacker & Birk, Wadsworth, Howland & Co., were each fined $50. The case against Reid, Murdock & Co., was dismissed on payment of costs.

Beneath the cold and comfortless earth
A miserly man was laid.
He hired a tinner to do his work,
And this is the debt he paid.

And many a maid and many a man
Can the grave of its victim rob,
In having their plumbing properly done
By giving a plumber the job.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

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Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

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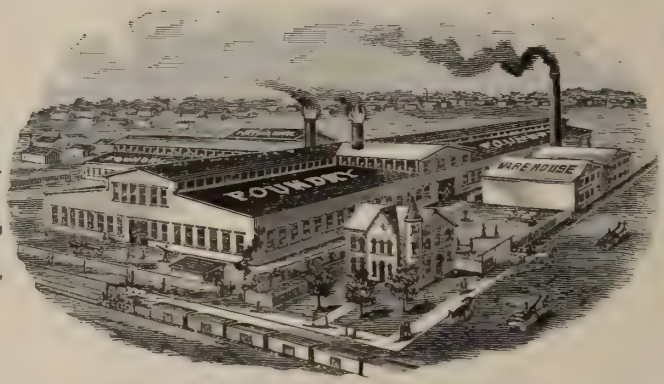

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SANITARY science works in a practical way and is not founded on fine spun theories. It determines in a scientific way the causes of disease and goes to work in a practical manner to remove the cause and prevent the disease. If the cause is found in food or drink or atmosphere it simply purifies the food, the drink or atmosphere and the disease is stopped. It is simple and practical in all its operations and there is nothing mysterious or incomprehensible about it.

THE subject of sanitary legislation has been largely in the hands of the master plumbers. A great majority of the ordinances and laws governing sanitary matters can be found to have had their origin with plumbers. This will continue to be true, for the close relation of the plumber to public health not only fits them for this work, but naturally brings the work to them. Had they accomplished nothing more than what they have done in the way of sanitary laws, they would have done good work.

THOSE seeking summer resorts should remember that the coolest places are not always the most heathful. They may greatly add to comfort, but they do not destroy the germs of disease in the water, air and the natural surroundings. Many complaints have been made of the condition of the drainage of these resorts and this particular should be carefully inquired into before a location for the summer is selected.

WE have received many compliments regarding our report of the convention for which we return thanks. While we are pleased to learn our efforts were appreciated we have done no more than discharge our duty to the trade in this regard, and we trust our future efforts in the weekly publication of THE SANITARY NEWS will merit the approval and well wishes of our patrons.

THERE is one thing we wish the public to remember: In all things the price of any commodity is regulated by quality. The best quality cannot be purchased with the least amount of money, and a low price generally is an indication of poor quality. A suit of clothes can be bought for fifteen dollars, but no one will think that they are cheap on that account. They may be found to be expensive at that price, while a suit at thirty or forty dollars may be a good investment. So it is with plumbing work. The cheapest is not the best or most economic. Good work and good material require a good price. The best cannot be bought with the price of the poorest. There is this difference, however. A cheap suit of clothes will harm no one. It will wear out soon and add some discomfort to the wearer, but physically it will probably injure no one; but a cheap job of plumbing is a continual menace to health. It has disease lurking in it at every fixture, turn and joint. It is not only money thrown away but it will prove to be an expense in the way of doctor bills, loss of time and all the anxiety, suffering and cost sickness brings. No one can afford to have a cheap job of plumbing put in his house. It is a waste of money, and the expense for repairs will soon amount to the price of a first-class job. Every builder should remember this and not seek for the cheapest plumbing but for the best.

ONE of the healthy signs of the times is the pretty general demand in our cities for practical plumbers for plumbing inspectors. This indicates that the people are beginning to comprehend the importance of good plumbing in its relation to health.

SOME WORK TO DO.

The report of President Griffith at the Cincinnati Convention showed a marked progress in the extension of the National Association in the number of new local associations and their affiliation with the National Association. The work of President Griffith's administration is most satisfactory, and his report shows that the year has been a very prosperous one. It shows what hard, efficient work will accomplish, and the result demonstrates that such work is richly rewarded. There is not a member of the National Association in the country who will not feel proud of the growth of last year. Not only has there been an increase in membership but the popularity of the association has been ex

tended. The knowledge of its aims and purposes has reached a wider circle, and an understanding of its beneficial results in relation to public health has been more greatly impressed upon the public mind. Altogether the results are highly satisfactory.

It now becomes the duty of every member to renew his efforts in carrying forward this work. The officers of the association for the present year are all good men and are not afraid of work; but individual members can do much in the work of organization. There are many localities yet to organize, and in these some member has acquaintances through whom he can start the work. The State Vice-Presidents can complete the organization, and in this way states can be completely organized. This is a work of great value, for the efficiency of any organization depends largely on its strength. Members go a great way in popularizing an association and in giving it influence and respectability. While the association is already strong with a great influence in its field of action, there are portions of the country in which its immediate influence is not as strong as it should be. This is all on account of a lack of local organization, for the good of the National Association is carried throughout the country by local associations. Local associations are the direct representatives of their several communities and through them the good offices of the National Association are largely discharged. The ideal association is the one which has local organizations in every city in the United States where the trade is represented. This can be accomplished and there is nothing visionary about securing such results. It will take work, but the reward will adequately repay all the labor and time expended. There is an army already equipped for the work. A membership of almost two thousand is now enlisted, and by a portion of the work being done by each individual member, the grand result will be an achievement well worth the effort. We believe there is not a member in the country who could not do something in furthering the work of organization. The first thing is to make the effort. Every one will not form a new organization, but the result of a united effort will be gratifying. It will not only strengthen the National Association in the way of membership, but its influence will be strengthened and its good works will be made known in localities where they are not now appreciated. This is a result worth working for and we hope it will be carried forward with a vim worthy of the cause. The stronger the National Association is the greater service it will be able to render the members, and greater will be the consideration it will receive from the general public.

WORK FOR WOMEN.

The housewife fills an important place in domestic, social and industrial economy. In almost all avocations she holds an equal responsibility and duty with man. There is one exception. The responsibilities and duties of housewife are discharged by her alone. Man can hardly be considered a helper in this high and honored position which is at the foundation of all earthly success, happiness and glory. Here she sits the uncrowned queen of the realm, and there is none too good to do her reverence.

In earlier times the housewife was a servant, permitted to engage in nothing but the severest drudgery. Now she governs so absolutely that there is none to dispute her title to the domestic throne or deny her rule throughout the domestic kingdom. Occupying the high position she does, it doubly becomes her duty to fill her place with all the ability, intelligence and industry her exalted position demands. The importance of the home in its influence upon the public health, morals and industry, demands that it be presided over by a genius all-sufficient for its limitless possibilities. The time was when cooking, sweeping, dusting, scrubbing and the like were the sum and substance of the housewife's labors. But that day has passed away, and with the fuller enlightenment of the nineteenth century, the greater development of the science of home-making and home-keeping, a higher duty and greater responsibilities devolve on those who take under their care the management of the household.

The art of decorating and beautifying a home has long been one of the accomplishments of the intelligent housewife. Adornments, draperies, paintings and music have given their charms to the comforts, peace, delights and inspirations of the home, and learning with its pleasures and refinements spreads its elevating influence throughout the family circle. But what shall we say about the hygienic care of the home? Has woman in this regard kept pace with the progress of domestic sanitation? In several of our cities women have formed health societies for the advancement of some interest touching the public welfare. In New York their energies are directed against filthy streets. In Pittsburg they are making war on the smoke nuisance. In Boston they have taken up the subject of garbage disposal. But in these as in other cities their efforts are directed toward the promotion of public health, while we have no doubt many of their homes are neglected as to their sanitary condition. This is the result, not so much of lack of interest, but thoughtlessness regarding its importance and pardonable ignorance as to what domestic sanitation is. We say pardonable because sanitary science in many of its branches which apply more directly to the home, is comparatively new. But this does not lessen its importance or take from the housewife the responsibilities it brings. Domestic hygiene occupies the first place in domestic economy, and no home is complete where it is not applied, its laws understood and obeyed.

Among the different branches of domestic sanitation along with the first in importance is plumbing and drainage. Whatever other sanitary conditions may be maintained with defective or poor plumbing, the health of the household is continually menaced and disease has an open and sure avenue to the home. It may seem strange to many, and probably laughable to some, to hear one speak of women in connection with plumbing. Yet here is something for women to learn if they wish all the knowledge necessary to fully fit them for all the responsibilities the housewife assumes. She should in a sense be a plumber. She should have that knowledge of the work which would qualify her to judge of the character of it, and enable her to recognize the good in distinction to the bad. We do not say that she should be able to wipe a joint or do any of the mechanical part of the work, but a theoretical knowledge of plumbing as it is practically applied to-day would add to her fitness for the discharge of her important duties.

A number of ladies were recently interviewed in New York with reference to their knowledge of plumbing, and without exception all of them confessed to a profound ignorance of the matter. Many expressed regret at this ignorance and felt ashamed to confess it, as it applied so directly to the science of housekeeping and held such an important place regarding the healthfulness of the home. Many expressed a desire to understand this branch of domestic sanitation, and some expressed an intention of attending the trade school in that city and taking up this branch of education. The director of the trade school was also interviewed on the subject, and we would not be surprised to hear of a class of ladies in the department of plumbing at an early day. The purpose of all this is not to make plumbers of the ladies, not to prepare them to stop leaks, repair plumbing work or the like, but to make them able to know when such is needed and how to go about getting it properly done. This part of housekeeping is generally left to the lady of the house, and it is well that she be prepared to give it intelligent oversight.

All ladies cannot attend a plumbing class to learn this; only a very few can. But are there not other ways in which this important information can be gained? Women associate themselves together to become enlightened on history, science, literature, cooking, street cleaning, garbage disposal, smoke abatement and the like, and why not on plumbing? In the hygiene of the home it is of the most importance, and surely every housewife is deeply interested in the health of the household. It does not seem amiss that she should be qualified to protect her home in this regard. It is an essential part of domestic education, and a woman self-reliant in this matter would be worthy of high esteem. She could thus protect her home from dangers consequent upon the wear and decay of plumbing material, and the tricks and frauds of the tinker.

How shall this work be started? There are several ways, but the one that first presents itself to our mind is the favorable position plumbers' wives are in to begin this work of education They have the advantage of a school with competent instructors at home. They could form an association and reduce to a system the instruction desired, and thus very important knowledge regarding the household could be imparted. The association could be properly officered with a constitution and by-laws, have stated

times of meeting, and it would have no trouble in getting qualified plumbers to deliver addresses on the subjects on which information might be desired. Investigation, study and experience would soon fit the members to give intelligent oversight to this important branch of domestic sanitation. The results of such an association are too apparent to need mention. The public would receive the first and greatest benefit in the sentiment it would create and the general interest it would awaken, and the healthier homes it would secure. It would have a strong influence in driving the frauds and incompetent plumbers out of the business, and leave the work to be done by the properly qualified plumbers. It would better the condition of the craft in this regard, and whatever improves plumbing and secures competent plumbers is a public benefaction.

NOTES AND NEWS.

The Attorney General of Maine gives an opinion that women may legally hold the position of members on local boards of health in that state. Appointments of women on these boards have been made this spring and the secretary of one board is a woman.

The Russian Medical Council follows the example set by Italy and France and prohibits the use of saccharin in articles of food and drink.

Public Health gives an account of an outbreak of typhoid fever, somewhat curious in its origin, occurring in one of the English sanitary districts. The excreta from two cases of typhoid fever had been thrown into an ashpit. Subsequently, some decayed fruit was thrown upon the same ashpit. This fruit was discovered by the children, who were all associated as playmates, and distributed and eaten by all of them. Seventeen cases of typhoid appeared among these children whose ages ranged from three to fourteen years.

The town of Carcassone in France was recently condemned by the Civil Tribunal to pay indemnities of 100 francs and 50 francs to two of its inhabitants in respect of damages they had sustained by illness caused by eating mushroons purchased in the public market. The grounds of the decision were that persons buying mushrooms had a right to expect that their innocuous quality had been verified by the inspector of markets before they were publicly exposed for sale, and that this official having neglected his duty the municipality was liable for the consequences of such neglect. They certainly do manage some things better in France than in some other countries, where *Caveat emptor* is the "custom of the trade" in nearly everything relating to food and drink.—*British Medical Journal.*

In the children's hospital in Paris, Grancher, in order to prevent house infection, surrounds each bed containing a case suspected of being contagious with a screen to prevent personal contact. He assumes that the danger of infection through the air is not great.

Sanitarium and sanitorium are words often used synonymously, but really of different, though allied meanings. Sanitarium is derived from the Latin *sanitas*, healthy and means a place of health, a health retreat, a spot where correct sanitary conditious prevail. Sanitorium is derived from the low or late Latin sanitorius, which in turn comes from the Latin *sano, sanare*, to heal, and means a place of healing, a curative retreat, a spot where active health-restoring conditions prevail. The former, in brief, is hygienic or prophylactic; the latter therapeutic. The same distinction is to be observed between sanitary and sanitory.

A Russian investigator (Savitzky) preserved tuberculous sputum on pieces of linen at the ordinary temperature of a living room and found that, under these conditions, the infectiveness of the tubercle bacillus was retained two months and a half, whether it was kept in darkness or in the light. His results are confirmatory of all preceding work in showing that this bacillus is very tenacious of life.

To make a good disinfectant, dissolve half a dram of nitrate of lead in a pint of boiling water, then dissolve two drams of common salt in eight or ten quarts of water; when both are thoroughly dissolved pour in two mixtures together, and when the sediment has settled you have a pail of clear fluid, which is the saturated solution of the chloride of lead. A cloth saturated with the liquid and hung up in a room will at once sweeten a fetid atmosphere. Poured down a sink, water closet, or drain, or on any decaying or offensive object it will produce the same result. The nitrate of lead is very cheap, and a pound of it would make several barrels of the disinfectant.

A French scientist declares that the domestic pets of the world carry at least thirty per cent. of the common contagious diseases from house to house.

A few pounds of copperas dissolved in a bucket of water and sprinkled in cesspools or any place emitting foul smells, will purify and sweeten them.

A disinfectant that costs very little and is perfectly odorless, is made by dissolving a heaped teaspoonful of nitrate of lead in a quart of boiling water, stirring it with a stick and then adding it to a pail of cold water. This is odorless and will not stain; it costs about 3 cents, and if it is thrown once a week down the bathtub, closet and stationary washbowl, it will be money well spent.

Investigations have been made by Serafini and Arata to determine the correctness of the belief that the foliage of trees has some influence in filtering out the bacterial contents of the atmosphere. Their method of procedure was to determine the number of bacteria in air under motion before and after it had reached the woods. The barometrical pressure, direction and strength of the wind, temperature at the edge and in the midst of the woods, humidity and rainfall, were all taken into consideration. As the number of observations was only 40, the investigators give the results with some reserve, nevertheless they believe that they are justified in affirming that forests do exercise the power of straining out the bacteria that are brought to them by the wind.

THE WORK OF THE NATIONAL ASSOCIATION.*

It is meet that we should pause at the close of this prosperous year, gather up the lessons of the past, and take counsel for the future. It has been but a few years since the great principles on which our association was founded were undefined, scattered amid the rubbish of thought that floated dimly before our minds, awaiting the developing touch of experienced wisdom and the formative forces of organized effort. There was a wrong somewhere, but so illy defined was it, so poorly recognized, that efforts to remove it were so aimlessly and ununitedly directed that our best endeavors were mocked and our purposes ridiculed. At that time the term "master plumber" was a misnomer; he was a slave—slave to the tyranny of established business customs; slave to the reckless, demoralizing practices of the dealers; slave to an embittered and hostile public sentiment; slave to the meanest drudgery and sacrifices of the trade; slave to his own weakness and submission. Manufacturers and dealers made common patrons of plumbers and consumers, and left the plumber nothing for his labor but the poor and uncertain wages of his hire. Supplies in retail were sold to consumers at wholesale prices, the plumber's kit was placed in the hands of the merest tyro, and the incompetent and unscrupulous filled our ranks. But it has been the history of all wrongs that their oppression impelled a resort to remedial measures, and these measures are suggested by the nature of the wrongs. As the nature of disease suggests the proper remedies to be applied, so did the nature of the wrongs we suffered determine for us the course to be pursued for relief. A disease fatal to the prosperity and life of our vocation afflicted the plumbing trade, but in the nature of that affliction we discovered the remedies for its eradication, and that remedy was trade protection. We were maligned, misjudged and misrepresented. We were called extortionists, lunatics and communists. Our motives were impugned, our rights denied and our honor assailed. But our triumph was another demonstration that the principles of justice are eternal and will prevail; and from the disease which menaced the very life of our trade, we rescued a profession which stands before the world to-day in the full strength and vigor of glorious manhood.

While selfish motives were attributed to us in the beginning of our struggle, the history of that contest, and the results of our final victory, demonstrated the broad liberality by which we were actuated, defined the justice of our purposes, the integrity of our convictions, and gave to the world another example of the tri-

*Read by Andrew Young of Chicago before the Ninth Annual Convention of the National Association of Master Plumbers at Cincinnati, June 23, 1891.

umph of principle. We not only defined and interpreted the underlying and immortal principles of protection, but we made a practical application of its virtues and demonstrated the wisdom of our course to the satisfaction of every interest concerned. Protection has not only elevated the trade and eliminated from our ranks the incompetent and unworthy, but its results have reached out and enhanced man's highest good and given to humanity the greatest benefactions of the age. Every interest it touched it bettered, and it touched every interest related to the highest public well-being. It has placed the sanitation of the home within the reach of all and given to every household the means of its own protection. It has placed the responsibilities of the plumbing profession into the hands of competent men, and made it possible for every individual to place about him the safeguards of a healthful home constructed in conformity with the best and most highly approved hygienic laws. It found the plumber a slave to the drudgery, hardships and uncertainties of a trade and left him adorned with the dignity of a profession. It found the manufacturers and dealers conducting an uncertain business with small, unreliable and untrustworthy purchasers, and left them in harmonious and prosperous relations with reliable and responsible patrons. It found the public at the mercy of the incompetent and unscrupulous, and left it in the full enjoyment of the security of all the requirements of hygienic law. Protection has been the open sesame to the temple of hygeia, the very halls of health.

I remember reading of the erection of a great temple. The workmen were puzzled over the presence of a great stone for which no place could be found in the massive structure on which they labored. Stone after stone was lifted to its place in the colossal walls, but for this stone of peculiar shape no place could be found. Day by day it was thrown aside, was neglected and moss-grown. The temple lifted its frowning walls in massive grandeur until their dizzy heights announced the nearness of their completion. Higher and sublimer grew the rugged pile of masonry, but for that one particular stone no use could be found. The stone became forgotten; the walls rose a little higher and stood like battlements against the king of storms and the conqueror time. The last stone was lifted to its place and yet the structure was incomplete. One stone was missing and could nowhere be found. At length a workman bethought him of the neglected and forgotten stone of peculiar shape. With mallet and chisel he freed it from the moss and rubbish that concealed its form; it was lifted to the incompleted niche of that marvelous structure and there became the chief corner of the most magnificent temple of earth.

Years ago the plumbers began the construction of a temple designed to withstand the storms of adversity, the shafts of malice and the arrows of injustice and wrong. The structure grew slowly, unsteadily but continually. The workmen earnestly, energetically and laboriously placed stone upon stone until the walls grew into proportions beautiful and inspiring. But incompletion marked the long efforts of the builders. At length a workman, a tireless, brave, undaunted workman, J. J. Wade of Chicago, found amid the rubbish a stone of dim and undefined form. With mallet and chisel in hand he bent to the burden of his toil and chiseled from the mass before him a form of beautiful mold. It was raised to the proud heights of the massive, rugged walls, and there the chief corner stone of our magnificent temple was found to be the rock of protection.

The good offices of our association did not stop here. There was another duty before us; one found in the enunciation of the principles on which our association was founded. The chaotic state into which plumbing had been driven demanded such elevation and enlightenment as would bring it into harmony with the general learning and progress of the age. True to their obligations and great purposes this duty was discharged until to-day the plumber receives the esteem, respect and honor of his fellowmen, and enjoys the dignity and consideration given to the learned professions about him. The subjects of sanitation and the advancement of preventive medicine were made the special care of our association. How well we have succeeded in this, the sanitary arrangements of these buildings about us and the healthfulness of the homes of this fair city are living witnesses. Not only this but you will find on your statute books and municipal records eloquent testimony of the full and intelligent discharge of every duty, every obligation that we assumed. And we can truly say that we have not put forth a single effort that has not resulted in public good. Statistics show the material benefit our association has been in the increased healthfulness of cities where the rate of mortality has been lessened by the introduction of plumbing rules and regulations which the master plumbers have formulated and endorsed. Not only is your municipal code evidence of the plumber's qualifications, but your boards of health have discovered in his profession one of the most important sanitary agencies, and your appointive and elective offices show the official recognition he has received. Sanitary science has made more progress in the past ten years than in all the preceding fifty. It may have been a coincidence, but it remains the truth, that with the organization of the National Association of Master Plumbers a new era was marked in the science of sanitation, and with it began a more healthful and substantial progress. It has touched and improved every condition of mankind and made the homes, the sources of the nation's greatness, the nation's pride and glory.

Having thus fulfilled every obligation to the public, is it not now time that our association should give some attention to the improvement of the condition of its members? Our association was organized for "sanitary, commercial and social purposes." We have accomplished all but one. We have been too busy to turn our attention to the advancement of our commercial interests. We have had a great public duty to discharge. We have discharged that to the letter, and may we not now be permitted to devote some attention to our own interests? There is a work to do in this regard. We must work among ourselves. Our organization has been adjusted to meet the pressing demand of the public. Let us now adjust it to embrace also our own prosperity and the financial advancement we have so justly earned. Let us say to our local associations, keep on in the great work for the public good, but at the same time resolve yourselves into a committee to foster, protect and promote your own interests. Utilize your association somewhat for your own good. Direct the forces of organized effort in unison with the advancement of your commercial prosperity. You have earned a just recompense for your efficient labors. Utilize the advantages of organization, if need be, by a closer organization and a stricter discipline. Remember that the competitor of the plumber is the plumber, and so direct your efforts that undue rivalry and ruinous competition may be turned into mutual assistance and honorable emulation. In a commercial sense it is your business to attend to your own business. No one will do it for you, and in your associations you have the means of inspiring, inducing or compelling your members to be just to their own cause, true to their own interests and loyal to those just and honorable business principles, the strict observance of which will secure to you your just reward—industrial progress and commercial prosperity.

The approaching World's Fair affords an opportunity that should not be lost. At that exposition the plumbers can place before the eyes of the world the most marvelous progress the age will witness. The advancement of the last decade displayed by a proper exhibit would be a surprise even to ourselves, and would immediately win the admiration and applause of the world. The good offices of our association have extended to every state and territory in the Union, and the public mind has made recognition of its important services. It now remains for the plumbers to accept the opportunities offered and give to the public tangible evidence of the great industries, extensive manufactories, developments of science, the activity of trade, the results of inventive genius—all working in harmony for the higher development of mankind under the benign influence of hygienic law and the immutable laws of right living.

In looking over this assembly we miss many familiar faces of honored and honorable men, members of our association who have gone to the rest and reward of the shadowy land. We can never forget them or lose the example of their faith in this association as shown in their works. We, the surviving members of the old guard, will in the fullness of time, pass away, leaving to you, young men, the carrying forward of the work to its fitting destiny. We place in your care and keeping an association whose foundation stone is justice, an organization that welded the

ties of friendship into bonds of brotherhood, and has linked the hearts of the members of our trade wherever found from the Atlantic to the Pacific, an association that has never had a Judas, an association whose principles and purposes are triumphant and enduring.

In olden time there was a king whose pride and ambition led him to construct for self-gratification the highest monument of the world. He called for the best artisans his kingdom could afford and placed them under the direction of his court officials that they might surpass the best efforts of all former ages in the erection of a column that should be the wonder of the age. After years of labor the huge shaft was announced completed. The king called for the best engineers of his realm to provide the means of erecting his monument and placing it on its base. Proud to serve their king the engineers came forward, placed the machinery, arranged the ropes and pulleys and informed their king that all was in readiness. The day for the final triumph of the proud king arrived. An edict was issued to the vast throng that had assembled forbidding any one from speaking above a whisper on the penalty of death. The hoisting appliances were adjusted and an army of strong men laid hold of the windlasses and began to turn. The ropes drew, creaked and tightened. The massive pillar of polished brass, silver-headed bolts and steel girders began to rise. Slowly and majestically it swung in air and admiring thousands stood breathless and uncovered. Higher and higher rose the monumental glory of kingly power emblemed in the glittering shaft that sparkled like entangled sunbeams. In that moment of adulation, pride changed to fear and horror chained the blood of the assembled populace. The colossal column stopped, swayed, and trembled above the heads of the throng in imminent danger below. The ropes creaked, stretched, slipped and blanched faces were turned up to approaching death and the fall of kingly pride. In this hour of hopelessness and fear, a man, clad in the robes of a mariner, climbed a little higher than the trembling multitude, and at the top of his clear, strong voice shouted, "Wet the ropes." Quick as a flash of light the deed was done. The ropes drew their parting strands together, the tackle straightened beneath the load, the windlasses turned and soon that majestic, resplendent pillar stood firmly upon its base, the embodiment of artistic and engineering skill and the pride of kingly power.

A few years ago the master plumbers of this country began the building of a monument to mark their achievements, their liberality and loyalty to principles. The great shaft was finished with all the strength and adornments of skilled workmanship, and the time for its erection had come. Grandly it swung loose from earth and in the sublimity of its form and purposes, it rose to the view of the admiring assemblage. But the ropes began to slip, the column swayed and trembled and its projectors gazed with apprehension at the threatened fall of their hopes. But out of the confusion and tumult, rose the clear, strong voice of wisdom, the successful voyager of the angry deep, and shouted, "Wet the ropes!" We did wet the ropes in the sweat of our endeavor, the windlasses were strongly manned and began to turn; Col. Scott turned, Macdonald turned, Murphy, Phillips, Weaver, Trainor, Graham, Sheehan, Gallagher, McCartney, Foley, Moylan, Murray, Hamblin, Lyon, Remick, Hannan, Regan turned; and with our united endeavor the most renowned and enduring monument of the age arose, and stands to-day the light of the world, the embodiment of truth, right and eternal justice.

POETRY AND PLUMBERS.

It is a deplorable fact that too many journeymen, and some "bosses" of the plumbing business, live so entirely in the atmosphere of the "shop," and are so impregnated with shop-talk that they are deaf or indifferent to everything else, real or ideal, that appears to benefit or amuse others.

To be honest we must admit that there is a lot of rhyme, commonly known as "machine poetry," published now-a-days which serves to amuse, and may possibly point a moral, even if it does not "adorn a tale."

Now to want a man "killed" because he writes poetry or rhyme (which ever you choose), nature having been so unkind as not to have made him a plumber, is, I think, a most uncharitable feeling to exhibit toward any man, and shows a heart and mind destitute of poetical fire and altogether prozy.

It is said, "the poet is born not made," but it can't be said of the plumber. He is "turned out" by the hundreds and "if not, why not?" The plumber is no extraordinary being; he requires but ordinary intelligence for the mechanical performance of his work as he now does it, but that same intelligence should lead him on to learn to appreciate and love other things, and there may come moments when such trivial things as poetry will lift him to a higher plane of thought and living.

You may not like poetry, my friend, but I suggest you read a little of it, say, "Pope's Essays," "Shakespeare," "Dante," "Longfellow," "Whittier" and some lesser ones, and it will do you good.

In conclusion:

Did we but use it as we ought,
This world would school each wandering thought,
To its high state.
Faith wings the soul beyond the sky,
Up to that better world on high,
For which we wait.

Yours for poetry, JOHN J. BLACKWOOD.

STEEL PIPES.

The Steel Pipe Company, of Kirkaldy, have done something toward showing the advantages possessed by steel over wrought iron pipes. It is stated by Mr. D. J. Russell Duncan, Assoc. M. Inst. C. E., that wrought iron or steel pipes can be produced at a less cost per unit of length than cast iron pipes. A pipe built of steel can be made at a less cost of labor than one of wrought iron, on account of the reduction in the number of plates and rivets, and, therefore, of calking and punching. Being less liable to corrosion than pipes of wrought or cast iron, the durability of steel is insured. It is stated by one authority that the best precaution is to have the pipes galvanized, then coated with natural asphaltum or with a composition of pitch, tar, petroleum, linseed oil, and chalk. This solution is heated in a bath to a temperature of 250°, and the pipes immersed till they acquire the same temperature as the composition. The pipes should also be coated as they are laid in the trench. As regards strength, the steel pipe is much superior to glazed stoneware or cast iron, or about three and a half times stronger than the latter. Mr. Duncan says: "As steel is on an average 1-3 times stronger than wrought iron, it is clear that for pipes of equal strength of plate, and allowing that the riveted or welded seams are of equal strength on both, the thickness of mild steel need only be about 0.77 of the thickness of wrought iron." This economy of material can be effected by using open hearth mill steel of the highest possible tensile strength.

CONVENIENT TO HAVE ABOUT.

Sulphate or chloride of zinc dissolved in water is a good disinfectant.

Moulds for casting iron can only be made in sand. Iron or other metallic molds chill the iron, and it does not fill well. The great heat at which iron melts will burn any other material, or will stick so as to break the mould.—*Scientific American.*

A lubricant may apparently do good work and keep that part cool, but in reality the acid formed by the friction and heat of the journal is daily damaging the surface of the metal and will ultimately do great damage.—F. H. Kuhne.

Iron sinks which have become rusted may be cleaned by rubbing well with kerosene oil, allowing the oil to remain on over night, then washing thoroughly with soap suds. If one such application is not sufficient, repeat the process.

Cork chips are now mentioned as the best substance for covering steam pipes. When used with any glutinous material, it will readily adhere to the pipes and form an excellent non-conduct or covering if laid on a thickness of about one inch, in cases where very large surfaces have to be covered.

In order to keep machinery from rusting, take one ounce of camphor, dissolve it in a pound of melted lard; take off the scum and mix as much fine black lead as will give it iron color. Clean the machinery and smear it with the mixture. After twenty-four

hours rub clean with soft linen cloth. It will keep clean for months under ordinary circumstances.—*The Practical Mechanic and Electrician.*

The numerous tests that have been made by learned men, at various times within the last twenty-five years, tends to show that mineral lubricants, or compounds of mineral and animal, are the safest and produce the best results.—F. H. Kuhne.

Cool the blood by drinking cold water in which a little pure cream of tartar has been dissolved.

To harden files the following will be found effective: Rub a little hard soap across the teeth to keep from scaling; heat to a cherry red, and dip endwise in salt water; then dip in hot fresh water to remove any salt on the teeth, dry over the fire, and wet slightly with linseed oil on a rag.

The following is said to be the Swiss method of hardening cast steel for cutting tools. Mix in a suitable vessel four parts of pulverized resin and two parts of train oil. Stir well in this one part hot tallow. Into this mixture the article to be hardened is plunged at a low red heat and held there until thoroughly cooled. Without cleaning off, the piece is again put into the fire and suitably tempered in the ordinary way. An examination of steel thus hardened indicates that the hardening is deeper and more uniformly distributed than is commonly the case, and that the steel is less brittle. Articles thus hardened have excellent and durable cutting qualities.—*Stone.*

THE SMOKE NUISANCE.

The sentiment favoring the suppression of the smoke nuisance is spreading rapidly. Communications come to this office from cities both large and small inquiring for the best devices for smoke consumption and prevention, and asking for information covering the general subject of smoke abatement. These communications receive personal attention and whatever aid asked is given as far as possible. The following letter was recently handed us and we give it publication for the purpose of aiding the Women's Health Protective Association in securing the addresses desired, and to inform the manufacturers of smoke-preventing devices that they have an opportunity of making an exhibit of their appliances in a city where they are in demand:

Pittsburg, June 15, 1891.

Mr. J. C. Ambler, Secretary Citizens' Association: The people of Pittsburg and Allegheny have begun a fight against the smoke nuisance. Since the partial failure of natural gas, the majority of the manufacturers of these cities have returned to the use of soft coal with its accompanying soot and grime.

The fight against smoke was originated and kept alive by the Women's Health Protective Association, and as secretary of the organization, I should be deeply obliged for the address of the proprietors of several of the smoke consumers mentioned in the report for 1889 of the Smoke Committee of the Citizen's Association. Judging from your report the appliances that give the most satisfaction are the Murphy furnace and the McGinnis, the Farr, the Murley, the Hall, the Bowe, the A. Ritter and the W. C. Thayer smoke consumers.

Would it be too much trouble to send me the correct address of all of the above except the Murphy, which has an agency here already?

We are especially anxious to have an exhibit of the most practicable consumers under the auspices of the Health Association at our annual fall exposition.

There is an ordinance against smoke founded on the Chicago ordinance now pending in both the Pittsburg and Allegheny councils; whether it will be passed or not we cannot tell. Our part is to keep the matter constantly before the public.

Respectfully, I. B. Oakley. Mrs. John M. Oakley, Secretary Women's Health Protective Association.

Such an exhibit as is spoken of above will be found to furnish the best demonstration possible that smoke can be prevented. This is of particular interest since we learn by letter from Mrs. Oakley that the committee to which the ordinance was referred in the Allegheny council, has reported adversely, on the grounds that no device for preventing smoke has been proved to be successful and practicable. This conclusion was probably arrived at by the committee through their inexperience of the use of consumers and a lack of knowledge of the results obtained by their use. It has been fully demonstrated in this city that the employment of these devices under the strict enforcement of the ordinance will abate the nuisance to an appreciable extent. This has also been the experience in other cities and of individuals who have devoted attention to the matter, and an exhibition of these consumers before this committee and the Allegheny council will convince them that successful and practical devices for smoke consumption have been produced.

In this connection we wish to state that as we are almost daily in receipt of letters inquiring about manufacturers of consumers, their address, etc., we would be pleased to hear from such manufacturers and receive circulars, descriptions, illustrations, etc., of their devices.

That public sentiment is turning sharply toward the abatement of the smoke nuisance is clear. This nuisance has been borne long and it is getting unendurable in many localities. The matter of interest now is the demonstration of its practicable abatement. Many of our cities are without ordinances regarding this nuisance, and many city officials are not informed regarding the merits of smoke consumers and are unadvised regarding their reliability. There is no proof needed that smoke is a nuisance. The proof that is now necessary is that it can be abated, and that there are devices manufactured that will effectually abate it. This has been demonstrated to a certain extent, but we hear every day from persons to whom the demonstration has not been made. They have not had the opportunity of observing their use, and do not know of their existence, and one of the difficulties in abating the smoke nuisance will be found to be that which was met with in Allegheny. But when this demonstration is made and it is learned that it is cheaper to consume smoke than to waste fuel in incomplete combustion, sentiment will turn in favor of the smoke-consuming devices.

PROTECTION OF WATER.

During the recent session of the Maine Legislature it passed a bill entitled, "An Act to Protect Waters used for Domestic Purposes," of which the following are provisions:

Sec. 1. Whoever knowingly and willfully poisons, defiles or in any way corrupts the waters of any well, spring, brook, lake, pond, river or reservoir, used for domestic purposes for man or beast, or knowingly corrupts the sources of the water supply of any water company, or of any city or town, supplying its inhabitants with water, or the tributaries of said sources of supply in such manner as to affect the purity of the water so supplied, or knowingly defiles such water in any manner, whether the same be frozen or not, or puts the carcass of any dead animal or other offensive material into said waters, or upon the ice thereof, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding one year.

Sec. 2. Whoever shall willfully injure any of the property of any water company or of any city or town used by it in supplying water to its inhabitants, shall be punished by a fine not exceeding one thousand dollars, or by imprisonment not exceeding one year; and such person shall also forfeit and pay to such water company, city or town three times the amount of actual damages sustained, to be recovered in an action of the case.

Sec. 3. The provisions of all general laws, and of all special acts inconsistent with this act, are hereby repealed.

WHAT "STAFF" IS.

The building material called "staff" not "stuff," says *Carpentry and Building*, of which it is proposed to construct the Chicago exposition buildings was invented in France about 1876, for use in the construction of the buildings for the Paris Exposition of 1878. Its first use was in those buildings, but it has been largely used ever since throughout Continental Europe. The name "staff" is a French word, without any inherent significance, and was invented when the material was invented. Staff is composed chiefly of powdered gypsum, the other constituents being alumina, glycerine and dextrine. These substances are mixed with water, without heat, and cast in molds, in any desired shape, and allowed to harden. The color is a dark shade of white, and other colors are produced by external washes, and not by new ingredients. To prevent brittleness the material is cast around a piece of coarse

cloth or bagging, or, more commonly loose oakum. The casts are generally shell like, and are not more than ½ inch thick, but may be several inches thick. They may be in any conceivable form in imitation of cut stone, rock-faced stone, moldings, carvings, and the most deligate floral ornaments. For the lower portions of walls, which are exposed to rough usage, the material is mixed with cement, which makes it so hard that wagons may run against it without injuring it. When well made, staff is impervious to water, and is as permanent a building material as marble or granite, though it costs less than a tenth as much. Several specimens of this material, in slabs about two feet square, have been left with Chief of Construction Burnham as samples, and have excited admiration. Any one can manufacture it with a little instruction. It is by no means certain that the exposition buildings will be faced with staff. All that has been settled is that they will be faced with that or some similar material, such as terra cotta or the other French invention, "carton pierre." These other kinds of material, however, have a poor show competing with staff. They are dearer, heavier, and not near so strong or beautiful. "Carton pierre" means "stone cardboard," and is made of paper pulp, whiting, glue and rosin.

STEAM SYSTEM OF HEATING.

The following is from the catalogue of the Exeter Machine Works:

During the greater part of the year in a large part of our country it is necessary to use artificial heat in our dwellings. It is therefore an important practical matter with every one to secure the needful warmth in the cheapest and most heathful form.

For many years inventors and manufacturers have been working to produce an apparatus that should combine the requisite qualities. All are agreed that the following points ought to be secured in any heating apparatus: Economy of fuel and apparatus; a good quality of the air that is heated; ease of distribution of heat; safety from fire; safety from explosion; freedom from dust and dirt.

It is believed that steam heat combines all these points to a degree that is not attained or approached by any other means. We propose to consider them somewhat in detail.

ECONOMY.—The burning of a ton of coal develops a definite amount of heat, which can be accurately measured. This heat cannot, all of it, be utilized to raise the temperature of our houses. Much of it under any circumstances will be conducted away through the stove or fire pot that contains the fuel. Experiments show that no other means of heating utilizes so much heat as the steam heating apparatus and at the same time imparts no dangerous quality to the air. That is, a ton of coal used in forming and distributing steam will give heathfully warmed air in a larger quantity than any other means of heating in use. The first cost of the apparatus will usually but very little exceed that of a furnace, if the furnace and hot air pipes are safely arranged. The excess of cost, if there is any, is much more than compensated by the durablility and slight expense for repairs.

QUALITY OF THE AIR.—Some kinds of heating apparatus render the air impure and unfit for sustaining life. This is done by the dangerous gases given off from the fuel, by the peculiar dryness of the atmosphere caused by contact with the red hot surface and also from the scorching of the fine particles floating in the air. It is well known that in the combustion of coal, carbonic acid gas and sulphurous acid gas are found in considerable quantities. It is easily shown that these gases pass through cast iron readily when the iron is heated to redness, and that it is almost impossible to render furnace joints gas tight and keep them so for any length of time. There is, therefore, always liable to be some one or all of these poisonous gases present in rooms heated by coal stoves or furnaces. It is not needful here to tell how dangerous such substances are to health and life; how many diseases, such as consumption and scrofula, are promoted by them; how the system is weakened by their presence and life shortened. Occasionally we see in the papers accounts of the death of healthy persons who had taken pans of coals into their sleeping rooms, and had been poisoned or suffocated to death in a few hours. Death by a slower but similar process, and no less sure, is creeping into many of our houses heated by furnaces and close stoves.

In furnace and stove heat there is a peculiar dryness or scorched condition of the air that is unfavorable to vitality and health. The effect of this is seen in the rapid shrinking of the wood finish and furniture, the falling apart of joints held by glue and in the parched dry state of the eyes and skin. Besides, the air is constantly mixed with fine particles of matter in the form of dust that floats in it, and that can be separated from it only with the greatest difficulty.

Professor Tyndall, by a series of experiments, has shown that these exist even in air that has been passed through water. When these particles come in contact with a surface heated to redness they become charred and give the sooty odor observed in heated rooms. The fact that this scorched air is less vitalizing than that which has not been heated to so high a degree is well known to physicians and other scientific men, though the explanation of it is not fully understood. With steam heat this scorching can never take place, and there cannot possibly be any discharge or formation of unhealthful gases.

EASE OF DISTRIBUTION.—One of the practical objections to furnaces is the difficulty found in conveying heat horizontally, especially when the furnace is but little below the room to be warmed. Thus, in a schoolhouse or church, two or three furnaces are frequently used to heat the same building. It is extremely difficult to heat different apartments on the lower story of any building, unless they are situated so that some part of them comes over the furnace itself. The freakishness of furnaces heat, depending on the force and direction of the wind, is a matter of common experience and cause of much perplexity. A steam apparatus will carry the heat with certainty wherever it is wanted, and no difficulty will be found in heating, from a single fire, the lower story of a building containing any number of rooms within one hundred and fifty feet of the boiler. Indeed, in many cases, heat is successfully carried more than five hundred feet.

SAFETY FROM FIRE.—Many of the most destructive fires owe their origin to the hot air pipes from furnaces. The pipes run within a few inches of wood work, and often become heated so as to char the wood near them, bringing it into a condition in which it readily takes fire. Few people are aware of the readiness with which seasoned wood burns when brought to a high temperature, even if it is not in actual contact with the fire or hot surface of a pipe. A few simple experiments with dry wood held near glowing coals will illustrate this, and show in how short a time simple exposure to heat will set fire to any wood. A perpendicular pipe that carries heat to the upper stories of a building, and branches horizontally, becomes hot at the upper end where the current turns, and wood within a foot of the pipe at that point is in danger. A large number of houses heated with furnaces will be found to have some such place as is here described that exposes to constant danger. The reports of the Fire Marshal of New York state that two-thirds of the fires of that city are traceable to the use of hot air furnaces. This is so well understood by the more intelligent men interested in fire insurance that rates are put higher up on buildings heated by furnaces than upon those heated by steam. With steam at low pressure the pipe is never at a temperature of more than 215°—seldom at more than 212°—and no such accidents from fire can possibly occur.

HOT WATER SYSTEM OF HEATING.

The following is from the catalogue of the Boynton Furnace Company:

Operating a hot-water heating apparatus in any dwelling is an assurance of safety. The whole apparatus is open to the atmosphere through the expansion tank and there is no pressure on the system other than the weight of water in the pipes.

The system is very simple and acts entirely by gravitation. When it is filled with water, and the fire lighted, the heat acts upon the water and circulation commences immediately, the colder or heavier water at once displacing the warmer water or that nearest the fire. This change of water continues until it is raised to boiling point, or 212° F., and after this point is reached, it is impossible for any force of fire to give further results. Attention to the fire is necessary only once in eight or twelve hours, according to the size of heater.

No trouble will be occasioned in starting the apparatus by reason of the presence of air in the system, as, being full of water,

air cannot have collected in the pipes during the time the apparatus has not been at work. In a hot water system air cannot possibly be admitted unless the water in the apparatus has been run off; even then, with proper attention when refilled, the air is entirely expelled by the incoming water.

There is no such thing as overheating in a low-pressure hot-water apparatus; it is impossible to heat water (except under pressure) above 212° F., the boiling point, and, as it requires over 500° F. to ignite the most combustible building material, any possibility of fire is entirely out of the question.

In a hot-water heater, should the fire at any time be allowed to die out, it will take the apparatus eight times longer to cool than a steam-heating apparatus; this heat-retentive property which water possesses also reduces attention to the fire to the minimum and thereby overcomes the serious objection so frequent with steam-heating plants. This is a most important feature where a permanence of temperature is desired, especially in hot-houses, conservatories, etc. The consumption of fuel by a hot-water heater in comparison with a steam boiler is a point that should be considered.

Water varies in temperature from 32° to 212° F., and when this latter degree is reached the application of heat cannot raise the temperature higher, but simply converts the water into steam. This process of converting water into steam is an expensive one. A pound of the best steam-producing coal will, in a good form of boiler, evaporate about ten pounds, or one and one quarter gallons of water into steam, while the same pound of coal will raise the temperature of over six times as much water from 40° to 200°. In evaporating water into steam, the cohesion of the water has to be overcome by separating the molecules, and thus a large excess of heat has to be supplied to convert these molecules into steam. It is for these reasons that so much fuel is required to convert water into steam and the expense of heating by steam so much greater than by hot water.

Steam flows only to its limit of confinement, where, cooling by the action of the cold air in contact with the heating surfaces, it continually condenses and lowers the temperature of these surfaces. With a hot-water apparatus, a steady, low fire can be maintained and, the pipes being full of hot water constantly on the move (never stagnant, as in the case of steam), a more uniform circulation of air can be secured.

A first-class hot-water heater connected with flow and return pipes of sufficient capacity to insure a perfect circulation, with ample boiler and radiating surfaces and with the aid of a good flue, will insure one of the best systems of heating known.

HEALTH IN MICHIGAN, JUNE, 1891.

For the month of June, 1891, compared with the preceding month the reports indicate that cholera infantum, cholera morbus, dysentery, typho-malarial fever, puerperal fever, remittant fever, typhoid fever (enteric) and diphtheria increased, and that inflammation of brain, membranous croup, pneumonia, scarlet fever, influenza and measles decreased in prevalence.

Compared with the preceding month the velocity of the wind was less, the prevailing direction was the same, the rain-fall was greater, the temperature was much higher, the absolute humidity and the relative humidity were considerably more, the day ozone and the night ozone were less.

Compared with the average for the month of June in the five years 1886-90, influenza and dysentery were more prevalent and typho-malarial fever, inflammation of brain, whooping cough, scarlet fever and diphtheria were less prevalent in June, 1891.

For the month of June, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was about the same, the prevailing direction was northeast (instead of southwest), the rain-fall was greater, the temperature was slightly higher, the absolute humidity and the relative humidity were about the same, the day ozone and the night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of June, 1891, at fifty-five places; scarlet fever at sixty-five places; typhoid fever at twenty-five places and measles at seventy-eight places.

Reports from all sources show diphtheria reported at nine places more; scarlet fever at one place more; typhoid fever at eight places more and measles at eleven places less in the month of June, 1891, than in the preceding month.

Henry B. Baker, Secretary.

Lansing, Michigan, July 2, 1891.

HOUSE BUILDING AND SANITATION.

With the growth of population in cities there is a corresponding increase in the value of real property says the *American Medical Association Journal.* This increased value of real estate is naturally followed by high rents, and in order to realize the largest possible revenue from a limited number of square feet of ground, the owner feels justified in erecting a building that is fairly a sky-scraper. And this without the slighest regard for the rights of his next door neighbor or the general public. Such buildings effectually darken adjacent structures by shutting off a goodly portion of God-given sun-light. They also impede a free circulation of air.

In the outskirts of the business section, elegant and inviting apartment houses are built, and in which are said to be found all modern conveniences, such as bath, water-closet, etc. These are necessary belongings in every modern city house, and in order to insure the health of the inmates, the location and construction of the plumbing work of such apartments is of the very first importance.

Our attention has been drawn in this direction by observing the great frequency with which the water-closet is stuck in an absolutely dark and unventilated niche or corner, and in many instances opening directly into the kitchen or pantry. Physicians visiting patients may with perfect propriety inquire as to the arrangement of the bath and water closet, and condemn or approve as his judgment may dictate. Many cases of sickness are directly traceable to just such causes.

One of the building inspectors should be a physician who is not only skilled in sanitary affairs, but who is also endowed with a knowledge of architecture so far as it pertains to all sanitary conditions of any building.

Practicing physicians are more or less accustomed to uninviting sights and noisome odors, but, for one moment think a little—just a very little of the wafting odors of a freely used and unventilated water closet opening into a kitchen where an omelet, or batter for griddle cakes are being prepared; or into the pantry where the butter and milk are acting as sponges in silently mopping up the foulness in the air.—Bah!

COATING FOR STEAM PIPES.

A non-conducting coating for steam pipes, etc., used for the past 10 years with perfect satisfaction by a Boulogne engineering firm, is described in the Revue Industrielle as being conveniently applied and cheap, while it can be prepared by any steam user. It consists of a mixture of wood sawdust with common starch, used in a state of thick paste. If the surfaces to be covered are well cleaned from all trace of grease, the adherence of the paste is perfect for either cast or wrought iron; and a thickness of 25mm. will produce the same effect as that of the most costly non-conductors. For copper pipes there should be used a priming coat or two of potter's clay, mixed thin with water and laid on with a brush. The sawdust is sifted to remove too large pieces, and mixed with very thin starch. A mixture of two-thirds of wheat starch with one-third of rye starch is the best for this purpose. It is the common practice to wind string spirally round the pipes to be treated, keeping the spirals 7 centimetre apart to secure adhesion for the first coat, which is about 5mm. thick. When this set, a second and a third coat are successfully applied, and so on until the required thickness is attained. When it is all dry, two or three coats of coal tar, applied with a brush, protect it from the weather.

STREET CLEANING IN BOSTON.

According to the newly organized street cleaning system of Boston, Mass., the city is divided into nine districts, in which the streets will be gone over in stated periods, depending upon location and amount of traffic. The foreman of each business section of the city has about 200,000 square yards of paved area to take care of with an equal force and plant. In the districts outside of the business section the forces are smaller, but are organized on

the same plan, and will be increased in size with the growth of the city.

The push cart patrol is designed to supplement the regular sweeping force, and is only to obtain in the streets and squares most frequently used in general trade, where the hourly accumulation of street litter is greatest in quantity, and most displeasing to the largest number of people moving from place to place.

One push cart takes care of 1,200 to 1,500 square feet, keeping the same in neat and presentable appearance throughout the day, and avoiding the difficulty of having the litter trodden into the pavement or blown about by the wind. The value of the litter thus taken up is about twice as much as the sweepings taken up by machines.

The number of sweepers in each of the large districts is such that 16 are allotted to every 12 miles of paved area. The number of teams to a district will vary according to the season and amount of dirt to be taken away. At present about six street carts are detailed to a district.—*Engineering Record.*

FOR THE DIGESTION.

During the rush of summer travel most railroads are trunk lines.—*Lowell Courier.*

After a jolly dog has had his day he usually goes to the bow-wows.—*N. Y. Herald.*

A famous race horse in Kentucky is named Little Brown Jug. Of course the animal is full of spirit.—*All Sorts.*

Woman used to sweep everything before her, but this spring she sweeps everything behind her.—*Elmira Gazette.*

The mosquito will soon be whetting his bill for the benefit of those who are looking for summer bored.—*Washington Post.*

Visitor (with a gun)—"Is there any small game about here?" Resident—"How would a 25 cent limit strike you?"—*Washington Star.*

No city-bred man has any business to expect satisfaction in a pure country life for two months, unless he has a genius for leisure and even laziness.—*Beecher.*

"What singularly crooked fingers that deaf mute has." "Yes. They used to be straight, but he tried to learn Russian. It's a fearful language for the fingers."—*The Sun.*

She—I hear that Mr. Sheffield Hall has written such a fine thesis that it will soon be out in print. Lopher, '91 S.—Oh, that's nothing; my thesis was out in print before I wrote it.—*Yale Record.*

"Woman," said Maj. Oldbach, "has always been at the bottom of wars. There was Helen of Troy and the Empress Eugenie; and now we have Mary Clausum stirring up a difficulty with England."—*Puck.*

Mamma (examining the proof of her small daughter's photograph)—Grace, why didn't you smile. Grace (aged 6 years, with an injured air)—I did, mamma, but the man didn't put it down.—*Harper's Bazar.*

"How did you like the performance at the Wardrobe Theatre the other night?" "Not at all. It was like an old turkey on the table." "Why?" "Because the only good thing about it was the dressing."—*Boston Gazette.*

Lawn tennis is a very exciting game, but it isn't half so exciting as the game played by the two young spectators who sit on a settee in the shade and look at each other instead of at the tennis court.—*Somerville Journal.*

"Aw, Nicely, old fellah, you look tiahd." "Jove, old chappie, but I should fawncy I might. Been working all the mawning." 'Working? Why, how, old fellow?" "I've been labowing undah an impression."—*Boston Courier.*

Questioner (meeting a lawyer with two books of equal size, one under each arm)—"What have you there?" "Laws passed winter before last." "And in the other hand?" "Repeals of the same laws passed last winter."—*Fliegende Blatter.*

She (icily, to rejected suitor)—Did I not say "never!" to you yesterday? Why do you ask me again? He (bravely)—Well, as this is the next day after "never" I thought I'd call to see if you hadn't changed your eternal resolution.—*Judge.*

Charles Fechter once played a part in which he was called upon to pace the deck of a ship. One night one of the boys who was making the waves roll appeared in plain sight of the audience through a hole in the canvas. Fechter was not at all disconcerted. "Man overboard!" he cried, at the same time leaning over the rail of the ship and drawing the youngster to the deck amid the rapturous applause of the audience.

PLUMBING NOTES.

The public make a good many jokes on plumbers' bills, but when a man procures a cheap job of plumbing the joke is on him.

We have the following letter from Mr. Gall, of Dewald & Gall, 9 Massachusetts ave., Indianapolis, Ind.: You have our best wishes for your future success. We have been noticing the difference in tone of your paper since you assumed control and can safely say you need have no fear of failure if you keep your paper up to its present standard. The greatest object that lies before our association now appears to be to extend its organization. There is much good timber and many bright minds outside of our fold that could and should be brought in, and no power can exert itself so strongly to this end as the press. With best regards for your future welfare and with kind wishes to our late president, Robert Griffith and the balance of our Chicago friends, we remain,

Respectfully yours, DEWALD & GALL, per Gall.

We are very thankful for these words of assurance and encouragement. Mr. Gall is a faithful and good worker in the association and his acquaintance with the needs of the association makes his opinion in regard to them worth something. We hope to see his suggestions acted on and organization carried out thoroughly in every state. As he states, there are good men not yet affiliated with the association who should be, both for their own good and the good of the association, and we trust the interest manifested by him will be shared by every member in the country. Give the cause plenty of Mr. Gall's, and the work will be materially advanced the present year.

The National Hot Water Heater Company of Boston, New York, San Francisco, and 108 Lake street, Chicago, made a beautiful display of their patriotism by sending out for the Fourth of July a handsome card having attached thereto by a white cord a blue and a red cork. The instructions on the card said: "At 11:55 o'clock, July 3, insert red cork in your right ear, allow the white string to repose quietly on your neck; place the blue cork in your left ear, and, decorated with these emblems of patriotism, enjoy a peaceful Fourth of July, slumber from 12 to 7 A. M., dreaming of sales of the Spence Heater, and credit the same to our account." If anything for the celebration of the Fourth beats this we would like to hear of it.

The eight hour strike of the building trades at Pittsburg has been virtually abandoned, and the several building trades have gone to work.

An epidemic of typhoid fever in Valley Falls, R. I., has been traced to poor drainage and privy vaults about a certain well. Over fifty cases have resulted from this source, and yet there are persons who place a light estimate on plumbing work.

One trouble with poor plumbing is that it is depended on to do the work of a good job, and it will not do it.

"Heating for Health" is a neat little volume by Frederic Tudor, sanitary architect of Boston, which has reached us from the Westminister Publishing Company, of New York. It is designed in this work to show how to heat a home in a healthful manner. It treats of the different methods and furnishes considerable information on this important subject.

Most all people know the importance of health, and they should also know that just that important is good plumbing.

A few issues ago we published an article on "Cutting Prices," in which we of course spoke against the custom which prevails to a greater or less extent in many places. We have received many letters commending the article and expressing thanks for its publication. Now, this subject is entirely in the hands of the plumbers. They can put a stop to cutting prices if they will once take the right steps. In every instance and in every place the plumbers can find a way to prevent this injurious practice. Let each plumber appoint himself a committee to prevent it and it will be done. No one wants to do work at ruinously low prices. It

does not pay and is demoralizing to a trade that should be placed above all such deleterious practices. Then why not support honest prices? Support each other and you will support yourselves individually. It is an easy matter to remedy. Just stop cutting prices and the whole thing is done. There is nothing made on such work, but it is a loss of money and injures the trade generally. There is no reason for it. Plumbers are entitled to good prices and can get them if they will. Don't cut prices.

We are in receipt of a pretty little pamphlet from Merchant & Co. containing description and illustrations of the Star Ventilator for the ventilation of all kinds of buildings, and for chimney, sewer and drain pipe ventilation. The pamphlet contains many letters of endorsement of this ventilator which speak in high terms of its merits.

The public should recognize the difference in relation to health of the value between good and bad plumbing. Many people favor an article because it is cheap; but plumbing is one exception that should be made at all times to this rule. Cheap plumbing is not only expensive but it is dangerous.

A report says that during the field day on Friday of the week of the convention Mr. Plum, of Milwaukee, gave a waiter a quarter and asked him to bring a nice lunch for him and his companion. "You shall hab my undewided 'tention dis day," said the lucky waiter, greatly to the delight of Mr. Plum. A later report says that the waiter has never been heard of since.

While the spirit of organization is in a very rubust state of health it should be encouraged to plant new associations throughout the country and in states where there is a lack of organization. It is a good time to push forward this work, and it is a kind of work that will richly reward the labor it will employ.

THE CHICAGO MASTER PLUMBERS.

There was a large attendance at the meeting of the Chicago Master Plumbers' Association Thursday evening, July 9, when President Whiteford called the meeting to order. Three members were initiated. The delegates to the Cincinnati convention were given two more weeks in which to prepare their reports, and they will be given at the next meeting of the association. An early adjourment was taken, but the members present sat till a late hour engaging in conversation, and cultivating that good fellowship which is so prominent a feature of this association.

WHERE PLUMBING WORK IS BEING DONE.

741 Ashland ave., A. Pagel; Albany ave. and Twenty-third street, C. Kostlevy; 5334 Aberdeen, M. Stack; 42 Byron ave., A. Pagel; 5641 Butterfield, J. W. Sands; 3322 Calumet ave., A. Minzensheimer; 5422 Calumet ave., D. F. Dewar; California ave., east of Twelfth, M. C. McDonald; 516 Clybourne ave., P. Gunderman; 265 Centre, G. Weibeck; 149 Diversey ave., Harvey & Mose; Eighty.ninth near St. Lawrence, J. Emblem; 9116 Exchange ave., Webster & Ceelhofen; 4635 Emerald ave., John Moran; 5127 and 5205 Emerald ave., M. Stack; Florence near Sacramento ave., J. Welsh; Fulton and Union Park Pl., M. C. McDonald; 203 Fourteenth, W. H. Rustman; 1011 Forty-fifth, A. Miller; 229 Fairview, Harvey and Mose; 605 Forty-third, M. Stack; 931 Fifty-first, M. Stack; 7732 and 7808 Green, Breyson & Son; 92 Humboldt ave., Harvey & Mose; 1525 Harrison, M. C. McDonald; 3835 Indiana ave., J. M. Collins; Iowa, west of Western ave., C. Kostlevy; 3353-55 Indiana ave., A. A. Campbell; 6549 Justine ave., J. Emblem; 911 and 932 Maplewood, A. C. Pagel; 150 Monroe, D. Daley; Monroe near Homan ave., Young & Cavanah; 862 Maplewood, Harvey & Mose; 5337 May, M. Stack; North ave. near Cleveland, Bayha & Bachman; Ninety-first and Exchange ave., Webster & Ceelhofen; 16 O'Brien, C. Kostlevy; 377 Oakwood boul., J. H. Roche; 866 Oakley ave., Harvey & Mose; Prairie ave. south of Forty-sixth, T. Kuhn; 1060 Polk, Watson & Davidson; 865 St. Louis ave., D. Shannon; 112 Sheffield ave., J. Leuz; 620 Sixtieth, Bryson, & Son; Stewart ave. south of Seventy-fourth, Dewar & Co.; 4454 School, A. Miller; 737 Seymour ave., Harvey & Mose; 6807 Sangamon, W. H. Murphy; 6712 State, W. H. Murphy; 46 and 48 Thirty-seventh, Harvey & Mose; 295 Twenty-first, J. H. Killian; 170 Townsend, T. W. Gruschon; 857 Tallman ave., Harvey & Mose; Van Buren and Honore, M. C. McDonald; Winchester near Twelfth, John Shannon; 100 Willow, J. Leuz; 7015 Wright, Thomas Conway; Webster ave. south of Seventy-fourth, Dewar & Son; Webster and Seventy-second, Dewar & Son; Wabash ave. near Forty-sixth, T. Kuhn; 8 Webster ave., Harvey & Mose; Wabash ave. near Forty-sixth, T. Kuhn; 690 Washington, T. J. Gilmore; 686½ Washington, T. J. Gilmore; Yale and Sixty-fourth, Dewar & Son; 88 Mozart, A. C. Pagel.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: H. B. Seeley is preparing plans for a 10-story fireproof warehouse, to be built at the corner of Fifth avenue and Jackson street, by W. W. Cole. It will be 88x160, and will cost $200,000. S. S. Beman has completed plans for the Chicago Medical College, to be built on Dearborn street, between Twenty-fourth and Twenty-fifth streets. It will be 4 stories, 110x106; cost, $100,000. The same architect has planned a beautiful 3-story residence for John Griffiths, to be built on Michigan avenue, near Twenty-sixth street; cost, $25,000. For the bank at Turner, Ill., of which D. C. Newton is president, he has planned a bank building, to cost $10,000. Thomas W. Wing will plan for George Hankins a 4 or 5-story apartment-house, to be built at the southeast corner of Michigan avenue and Forty-second street. It will be 100x161; cost, between $75,000 and $100,000. Furst & Rudolph has planned a 5-story factory, 80x150, to be built on Union street, near Indiana, by Brown & Fitts; cost, $50,000. They have also planned a 5-story addition, 68x140, to the building at 73 North Ann street, occupied by the William H. Bunge Co.; cost, $35,000. For W. J. Moxley they have planned a 5-story addition to his factory, at 63 and 65 West Monroe street; cost, $18,000. Wilson & Marble have planned for Jacob Kramer a 4-story and basement store and flat building, with a frontage of 136 feet and a depth of 70 feet, to be erected at the northeast corner of Madison street and Hoyne avenue; cost $72,000. Beers, Clay & Dutton are planning a beautiful residence for J. Foster Rhodes, to be built at 1519 Prairie avenue; cost, $25,000. The same architects have planned for J. C. Smith, a 2-story and attic residence, 36x60 to be built on Lexington avenue, near Fifty-second street; cost, $17,000. Hetherington & Warner have completed plans for a 3-story store and flat building, 38x76, for A. Bradley, to be erected on West Adams street, near Francisco; cost, $12,000. They have also designed for S. Bus a 3-story and basement store and flat building, 24x75, to be built on Harrison street, near Loomis; cost, $10,000. A. G. Lund has planned four 2-story flat buildings for S. Dombey, to be built at 7237 to 7242 Stewart avenue; cost, $30,000. John H. Wagner has planned for Gormuly & Jeffrey a 6-story factory, 100x60, to be built on Franklin, near Pierce street; cost, $35,000. He has also planned a 2-story flat building, 50x60, to be built on Wabash avenue near Forty-fourth street, by Mrs. White; cost, $12,000. I. K. & A. B. Pond have designed for W. W. Catlin a 2-story frame house, 36x47, to be built at Ingleside, Evanston; cost, $7,000. For J. Wilson Howe they have planned a 2-story and basement frame cottage, 33x44, to be built on the same property; cost, $5,500. For H. E. C. Daniels they have also planned a 2-story attic and basement frame residence, 30x66, to be built at Evanston; cost, $8,500. For Mr. Brooks they have planned a 2-story attic and frame house, 31x41, to be built at Ingleside, Evanston, at a cost of $6,000; and for Hosmer C. Porter a frame house, 34x42, 2 stories high, to be built at Rockford, Ill.; cost, $6,500. W. A. Arnold is preparing plans for six 2-story and basement double houses for the Bennett Estate, to be built at Evanston. Faber & Pagels have planned for R. D. P. Switzer a 3-story and basement flat building, to be built at the corner of Twenty-first street and Homan avenue. The same architects have planned a 3-story and basement apartment-house for H. Fredericks, to be erected on West Huron street. Thomas Scott has planned a 2-story and basement addition, 32x57, to the Maywood school building, to cost about $9,000. J. C. Bronson is planning for F. G. Baker a very pretty 2-story basement and attic residence, to be built on Palmer street, between Wilson and Sunnyside avenues, Ravenswood; cost, $10,000. George Grussing has planned for Thomas Foster a 2-story and basement flat building, to be built on Sacramento avenue; cost, $10,000. M. E. Bell has planned a 5-story store and office building, to be built at Spring-

field, Ill., at a cost of $40,000.——Philadelphia, Penn.: Architects Hazlehurst & Huckle, 410 Walnut street, have completed the drawings for a large parsonage, to be erected at Park avenue and Norris street, by the congregation of the Park Avenue Methodist Church. An auditorium will be built by George F. Pfund at Germantown avenue and Nicetown lane. It is said that the plans for the new temple for the Keneseth Israel Congregation will soon be submitted to contractors for estimates. A 4-story warehouse, 38x58, will be built at 2310-2312 North Eighth street, by Charles A. Patterson, the contractor. On the south side of Wyalusing avenue, east of Fifty-fifth street, a 4-story factory, 50x162, will be erected by Henry Burke. Six large 3-story dwellings will be erected on the west side of Thirteenth street, south of Wharton, by Charles O'Neil. Architects Moses & King are making the plans for a large hotel and two school houses, to be erected near Camden. The plans for the proposed alterations and additions to be made to the Master Builders' Exchange have been submitted to the Board of Building Inspectors for confirmation. The work will be done under the supervision of Architects Wilson Bros. & Co. Otto C. Wolf will soon award the contract for the erection of a large stable in the city. He also has the drawings for a large brewery under way. A large brewery will be erected by Stocker & Reling on North Eleventh street, Reading.——Cincinnati, Ohio: Architect S. S. Godley has plans for a residence for Simon Sturm. To be two and a half stories, built of common brick, stone foundation and trimmings; cost, $12,000. The G. A. Gray Co., Sycamore and Abigail streets, will erect a foundry. To be five stories, built of common brick, stone foundation; cost, $25,000. Architect I. Richter, Jr., has plans for a residence for Henry Rattermann; cost, $7,000 The same architect has prepared plans for a residence to be erected on Price Hill for W. B. Morrow; cost, $4,000.——Washington, D. C.: Messrs. Jonas, Gibbs & Co. are preparing plans for a 3-story dwelling that will be erected for Mrs. M. Anderson at Spokane Falls, Wash.; cost, $25,000. Mrs. Rosa Davis is having plans prepared by Jonas, Gibbs & Co. for the erection of a 3-story and basement dwelling near Dupont Circle; cost, $10,000. The contract for building the residence for Mrs. Clover at the intersection of New Hampshire avenue, Q and Eighteenth streets, has been awarded to Messrs. Emmett & Heisley, who will commence work at once. The contract price is $75,000, and the plans were prepared by Architect T. F. Schneider. Messrs. Barnes & Weaver will erect a 6-room cottage at Colonial Beach from plans prepared by Mr. George Cooper, architect, for Mrs. A. M. Weaver. Mr. E. J. Hannan will have built on Thirtieth street, between Q and R streets Georgetown, from plans being prepared by Architect N. T. Haller, a 2-story and cellar dwelling, 20x70. It will have a front of pressed brick and Hummelstown brownstone.——Milwaukee, Wis.: Architects Schnetzky & Leibert have prepared plans for a school building for Concordia College, Cedar and Thirty-first streets. To be two-stories, built of common and pressed brick, stone foundation. Architects Van Ryn, Andree & Lesser have plans for a store and office building to be erected on Grand avenue between Second and Third avenues, for Richter, Schubert & Dick. To be 50x100, seven stories, built of brick; cost, $70,000. Architects Schnetzky & Liebert have plans for a tannery to be erected on Commerce street for A. Trostel & Sons. To be 50x130, five stories, built of common and pressed brick, stone foundation and trimmings; cost, $40,000. Architect E. Stollenwerk has plans for stores and flats to be erected corner Howell avenue and Clarence street for Ph. Liesenfeldt. To be 44x70, two stories, built of common and pressed brick, with stone foundations and trimmings; cost, $6,000. Architects Schnetzky & Liebert have plans for a store building to be erected at Winnebago and Eleventh streets for Jacob Katz & Co. To be 68x146, four stories, built of common and pressed brick, with stone foundation and trimmings; cost, $45,000. Architects Schnetzky & Liebert have plans for a brewery for the Plymouth Brewing Co. It will be built of brick and stone; cost, $25,000.——Denver, Colo.: Architect James Murdock has prepared plans for a 5-story stone front apartment hotel, to be erected at Seventeenth and Logan streets; cost, $135,000. It is to be completed and opened by October.——New Haven, Conn.: Architect L. W. Robinson has awarded the contracts for the new building which Mrs. Jane Winchester is to erect on Chapel street. It will be four stories high and cost $40,000. A new building is to be erected for Wm. Neely & Co. on Center street. This is to be a 3-story addition to the present store, 71x105 feet. D. R. Brown is the architect, and the cost will be in the neighborhood of $50,000.——Maycross, Ga.: Architect G. L. Norman, Atlanta, Ga., has prepared plans for a court house for Ware county, Ga. To be two stories, built of brick, stone foundations and trimmings; cost, $20,000.——Tulia, Tex.: A court house will be erected at a cost of $40,000. F. Faulkner, county clerk, will furnish information.——St. Louis, Mo.: The Union M. E. church will erect a $40,000 edifice. A $30,000 church bhilding will be erected by the Mt. Cabanne Christian church.——Minneapolis, Minn.: The Minneapolis Grain & Feed Co. will erect a grain elevator and warehouse at 715-717 Central avenue; cost, $30,000.

HEATING AND LIGHTING.

The following electric light companies have been recently formed: Harvard Electric Light & Power Co., Harvard, Ill.; capital stock, $15,000; incorporators, J. E. Keely, A. W. Young, E L. Church.——Platteville, Wis.: Electric Light & Power Co.; capital stock, $10,000; incorporators, J. H. Evans, W. G. Jennings, W. L. Corkwood, O. E. Gibson, D. E. Gardner.——River Falls, Wis.: Light, Heat & Power Co.; capital stock $50,000; incorporators, F. J. Burhyte, R. N. Jenson, W. W. Thayer, and others.——Chicago, Ill.: Heat, Light & Power Co., capital stock, $20,000,000; incorporators, D. E. Davis, T. & W. Barratt, T. D. McKay, E. Kaufman.——Santa Anna, Cal.: Gas & Electric Co.; capital stock, $100,000.——Bellevue, O.: Light & Power Co.; capital stock, $20,000.——New electric light plants or extensions of existing systems are reported as probable at East Portland, Ore.; Albia, Ia.; Sanford, Fla.——Mechanicsburg, Pa.: A committee is investigating the question of establishing an electric lighting plant at this place.——Wheeling, W. Va.: By a large majority it was voted to establish a municipal electric light plant.——Chillicothe, Ill.: The Chillicothe Electric Light & Power Company has been organized here with a capital stock of $50,000. Messrs. S. B. Hartz, George H. Lucas and Everett W. Wilson are among the incorporators.——Long Island City, N. Y.: The Crescent Electric Light Company has been incorporated here, with a capital stock of $25,000. Directors for the first year are: George Gray, Jr., E. P. Foster, and others.——Canajoharie, N. Y.: The Canajoharie Electric Light Company has been incorporated here with a capital stock of $10,000. The directors are: W. J. Arkell, A. G. Richmond and others.——Salina, Kas.: For recent developments regarding the electric lighting project at this place address R. R. Price.——Loveland, Colo.: The town authorities are discussing the question of establishing an electric lighting plant.——Windsor Locks, Conn.: Extensions are to be made to the local electric light plant.

SEWERAGE NOTES.

Lebanon, N. H.: Surveys are being made for sewers——Gloverville, N. Y.: A number of sewers are projected.——Bloomfield, N. J.: The town will spend $30,000 on a main trunk sewer from Weaver ave. to the Passaic river.——Williamsport, Pa.: The sewer bill has passed.——Pittston, Pa.: A sewerage system is projected.——Macon, Ga.: Plans and estimates will soon be prepared for the completion of the sewerage system.——Mobile, Ala.: Address Mr. Robert Gage in regard to a contemplated sewerage system.——Ann Arbor, Mich.: The city wishes to bond itself for $20,000 for sewers, and will try to secure the passage of an enabling act by the Legislature.——West Bay City, Mich.: The city will spend $10,000 on sewers this year. Address for particulars City Engineer Blomshield.——Streator, Ill.: Plans and specifications are now being made for a complete sewerage system.——Great Falls, Mont.: It is proposed to construct a $25,000 main sewer at this place. City Engineer Morley can furnish particulars.——Corry, Pa.: Sewers will be built.——Freeland, Pa.: This place is to have a system of sewerage.——Port Huron, Mich.: The sum of $29,342.78 has been appropriated for the construction of the Twelfth street sewer.——Puyallup, Wash.: A separator system of sewerage is to be built. The cost will approximate $45,000.——Los Angeles, Cal.: The City Engineer has submitted a plan for an outfall to the ocean, at an estimated cost of $350,000.——Cambridge, Mass.: Additional

sewerage construction to the amount of $15,000 will be carried out this year.——Canton, Ohio.: $40,000 will be spent for the disposal of sewerage.

WATER WORKS NOTES.

Kennebunk, Me.: The Mousam Water Co. has organized with S. I. Fuller as president.——St. Johnsbury, Vt.: The St. Johnsbury Aqueduct Co. will lay new pipe at an estimated expense of $25,000.——Marblehead, Mass.: The town has appropriated $10,000 for use by the water commissioners.——Worcester, Mass.: Additional pipe will be laid.——Cattaaruqus, N. Y.: A new company with a capital of $20,000 has secured a franchise.——Lyons, N. Y.: An increased supply is projected.——Marlborough, N. Y.: A system of water works is proposed.——Walden, N. Y.: Plans and estimates for works made and a water board organized.——Rutherford, N. J.: The Rutherford Water Co. has been incorporated; capital, $100,000.——Luray, Va.: A fair proposition to the town and the Valley Land and Improvement Co. might secure a franchise. The population is 2,500.——Plymouth, Mich.: It has been voted to build works not to exceed $30,000.——Centralia, Ill.: Works estimated to cost $65,000 have been recommended by Engineer Joyce, St. Louis, Mo.——Mannington, W. Va.: The Mannington Water Supply Co. has been incorporated; capital, $25,000.——Marion, N. C.: Address James Morris, mayor, in regard to proposed city works.——Piedmont, Ala.: Offers for a 20-year franchise are still wanted.——Hillsboro, Ohio: Works are proposed.——Pontiac, Ill.: Contracts for city works to cost $50,000 will be let soon.——Albia, Ia.: The people have voted for water works.——Deadwood, S. Dak.: The city will put in water works.——Spokane Falls, Wash.: Bonds to the extent of $500,000 have been voted for water-works improvements.——Woodstock, Ont.: Town works will be built this season at a cost of $105,000.

BIDS AND CONTRACTS.

Norfolk, Va.: I. H. Harn, Clerk of the Board of Supervisors will receive bids until July 27 for erecting a county court house and jail.——Orlando, Fla.: The Clerk of the Circuit Court will receive sealed proposals for the erection of a court house. A. D. Wagner, architect, of Williamsport, Pa., has copies of the plans and specifications. Bids will be received until noon, August 4.——Boston, Mass.: Bids are wanted until July 20 for heating and ventilating the Massachusetts State House extension. John D. Long is a member of the construction committee.——Wellston, Ohio: Bids for building water works to be owned by the city will be received until July 20. Address J. M. Ervin, Mayor,——Madelia, Minn.: Bids are wanted by the village until July 29 for constructing a high tank, furnishing and laying mains. C. Cooley is Recorder.——Springfield. Mo.: Proposals for the construction of a system of sewerage will be received by G. W. Hackney, City Clerk.——Terre Haute, Ind.: The Common Council will receive bids the evening of July 21 for the construction of about 4,400 feet of brick sewer, and 4,000 feet of pipe sewer. Address Frank H. Cooper, City Engineer, for plans.——Moscow, Ida.: Proposals are wanted until July 25 for the construction of a complete system of water works. Address J. W. Lenallen, City Clerk, as above.——Flanagan, Ill.: Proposals are wanted until July 21, for the construction of a complete system of water works. Address E. Litchfield, President Board of Trustees, as above.——Butler, Mo.: A. L. Badgley, Chairman of the City Council, will until July 15, receive bids for an electric light plant and gas works.——Hallettsville, Tex.: M. S. Townsend, Mayor of this place, wants bids for a system of electric lights.——Piedmont, Ala.: Proposals are wanted, no date specified, for the construction of a system of water works at this place.

$6.00 to Cincinnati and return. The Big Four Route, C. C. C. & St. L. Ry., will sell Excursion Tickets good going on trains leaving Chicago 9:15 A. M. and 8:15 P. M., Saturday, July 18th, and good returning until Tuesday, July 21st, inclusive. City Ticket Office; 234 Clark Street. Depots foot of Lake, Twenty-second and Thirty-ninth streets. J. C. Tucker, General Northern Passenger Agent, 234 Clark Street. Oscar G. Murray, Traffic Manager. D. B. Martin, General Passenger and Ticket Agent, Cincinnati, Ohio.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.

The Electrician suggests that a fuse which would melt on the overheating of a lamp burner and automatically extinguish the flame would be a useful feature in the kerosene lamp of the future.

A coating for boilers is made of cork bricks which are manufactured in Germany. These bricks are made of fragments of waste cork held together with a small proportion of white cement.—*The Engineer, N. Y. City.*

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BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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THE matter of maintaining prices is important to plumbers. A custom of cutting prices and doing work where no profit is made is a ruinous one for it will soon reduce the general price of work to the lowest plane. The tendency is not upward for anything that is to be bought. The course is downward, and those who have plumbing to be done will not pay more than is asked or bother themselves about getting an opportunity to pay more than is charged. While the tendency of the buyer is downward the tendency of the seller should be upward in price whether it be of material or work. Sometimes it may be policy to do work for a little less than it should be done for, but it is a dangerous practice. Let the motto be, honest work and honest prices.

SOMETIMES we find persons who are not acquainted with newspaper practices who return a copy of THE SANITARY NEWS and inform us that they have not subscribed for the paper. We are sending out a large number of sample copies to persons who are not subscribers in hopes that they may become such, and no one not a subscriber need never be afraid of getting a bill. Keep the paper and read it. It will do you good if it does not cost you anything. If you like it and subscribe for it, it will do you more good.

THE rarest specimen of humanity on earth is the one who has not heard of the enormity of a plumber's bill. The next rarest is the one who is willing to pay good prices for good plumbing.

A SANITARY exhibit at the World's Fair, if properly made, will advance the science to a very marked degree. A proper display of sanitary appliances, those relating to lighting, heating, plumbing and drainage, ventilation water-works and sewerage would be an object lesson in domestic hygiene more important and practical than lectures, reports, statistics and the usual modes of imparting knowledge. In the first place an adequate display of these appliances at such an exposition would attach to them an importance partaking of the nature of the great exhibition made by the nations of the earth. It would also be the means of giving the visitors an opportunity to see the latest and most approved methods of making a home healthful. It can be taken for granted that the best would be on exhibition and in working order so that their merits could be plainly understood. An important lesson in sanitary plumbing and drainage would be given in the most direct and impressive manner possible. Appliances necessary for the proper sanitation of buildings would be on exhibition, of which the general public are unfamiliar and do not appreciate their worth. There can no other exhibition be made of so much importance as this, or as closely related to man's highest welfare.

WHEN boards of health, the great majority of whose members are composed of doctors, recognize in plumbing and plumbers important sanitary agencies, it surely is time for the public to believe there is something more than talk in good plumbing.

IT should be remembered that the plumbers' bills of which we hear so much include both material and skill. The lawyers' bills, which outrank those of the plumber in proportions, include only skill and that sometimes of a very doubtful character. The one may save somewhat of your pocketbook, but the other will save more of your life.

WE are pleased to announce the appointment of Mr. James Allison, of Cincinnati, to the position of Chief of the Department of Machinery by the World's Fair directors. No better selection could have been made, and all of Mr. Allison's friends are ready to vouch for his efficiency and the full discharge of his duties. Throughout the plumbing trade he is well known, having been President of the National Association for two terms. In business, in public and private life, he is honored, respected and loved. Active, energetic, intelligent and public spirited he will bring to his new position a conscientious and executive ability, that will make his department a marked success. He is courteous, gentlemanly and able, and his popularity is extensive with his large acquaintance. We congratulate the Board on their selection, and extend to Mr. Allison our hearty well wishes.

HEALTH AND BUSINESS.

We publish two articles in this issue of much merit and interest to the trade. One is by W. A. Kelly, of Cleveland, O., and the other is by Dent Yates of Kansas City, Mo. The one by Mr. Kelly was read before the Cincinnati Convention, and that by Mr. Yates was read before the Master Plumbers' Association of Kansas City. The public has heard from these men before through the columns of The Sanitary News and will be pleased to hear from them often. They always write something worth reading, and, both being intelligent, observing, practical men, they write of subjects worth hearing about. The two articles referred to are of interest from the fact that one treats of the science of plumbing in its relation to health, and the other treats of the business of plumbing in its relation to the commercial prosperity of plumbers. Both touch two important subjects for consideration, and both are of interest to the trade. The plumbers have, particularly since the organization of the National Association, devoted much thought, time and means to the advancement of plumbing in its important relation to preventive medicine or the science of sanitation. They have been foremost in this matter, and it is owing to their efforts and efficient labors that sanitary science occupies the advanced place it now does. Had the master plumbers of this country withheld their services from this branch of domestic hygiene, sanitary science would be to-day about where it was a decade ago. The marvelous progress this science has made during the last ten years, is to a large extent due to the intelligent services of the plumbing fraternity. Their services have been nearer the home than that of any other. They have done for the household what no one else could have done. They have made it possible for all to enjoy a healthful home and escape the dangers of bad plumbing. That there are poor and unreliable so-called plumbers still in the trade doing plumbing work is no fault of the reputable, honest plumber. If no one would employ the incompetents, they would soon seek some other field of labor and leave all plumbing in the hands of those who know how to do it properly. But so long as ignorant, indifferent or miserly people let contracts or give work to these incompetent workmen, so long will they continue at the business, and so long will there be poor plumbing to complain of.

There are persons who laugh at this idea of sanitary plumbing, but ignorance laughs at a great many serious matters. They pretend to believe that all plumbing is alike and the bills are all that receive attention which are continually worked over on attempts at jokes. There is no joke about bad plumbing whatever there is about big bills. There is a vast difference in the way in which plumbing may be done. It can be arranged so that ill health will surely result, or it can be so planned and executed that the home will be perfectly secure from the ills that follow filth, bad air, poisonous gases, and disease germs. This is the difference, and when anyone employs an incompetent workman to do his plumbing he is inviting all these ills into his household. There are good plumbers everywhere to do the work and no one is forced to accept the evils of bad plumbing.

Mr. Kelly dwells on the importance of legislation governing plumbing. This is the method to be pursued. It has been demonstrated that municipal legislation defining the manner in which plumbing should be done, the rules and regulations governing the work, have done more toward advancing the cause of health than any other one thing. In most every city where such laws have been enacted it has been done through the influence and work of the plumbers themselves. Such laws are a necessity. They not only procure proper plumbing through their enforcement, but they serve to educate the people in this department of sanitary science. Wherever these laws are enacted and enforced the people have healthier homes, the city has better citizens, its prosperity is greater, and the unfit and irresponsible are disqualified and not permitted to do work. This leaves the work in the hands of competent men where it should be. We would like to see the suggestions Mr. Kelly makes carried out, and laws governing plumbing and the sanitation of cities enacted in every community where plumbing work is done. When such laws are enacted and administered by competent, practical plumbers, then our cities will have advanced in the cause of sanitation to an extent which can not otherwise be attained.

Mr. Yates presents some useful suggestions to plumbers in relation to figuring on work. He considers the business interests of plumbing, and the two articles are good companion pieces, for these two interests go together in all plumbing work. The plumber has a right to do a good business and make money just as anyone else has. It should be the aim of the fraternity to figure out a just profit on every job they do. It does not pay to work for nothing at anything. Mr. Yates gives a plan which if followed carefully, will insure the plumber a profit. Carefulness in figuring, a clear understanding of what is to be done, and the cost of everything furnished, form the bases on which a profit can be figured out understandingly. Before any figuring is begun the plumber should determine that he will not work for nothing, that he will have a fair margin for profit; then he should calculate so carefully everything included in the specification that he could add his time, capital invested, labor, etc., so as to know exactly what will be left for him to put into his pocket or into his business. This half guess work is too apt to leave the margin on the wrong side. One is more apt to get the price too little than too large. Mr. Yates' advice and suggestions are worth keeping about for ready references. He writes understandingly and to the point, and on a subject that should be given careful attention by every plumber. We commend these two articles to all plumbers. They mean good work and good prices. The public is dependent on the plumber for sanitary homes, but the plumber is dependent on himself for heathful pocket books.

NOTES AND NEWS.

Birch oil in a pure state is such heavier than water. Thirteen fluid ounces weigh a pound, and instead of rising to the top of water, it settles, to the bottom of it, where, in its action when moved, it resembles quicksilver.—*The Engineer, New York City.*

Iron rusts readily in all locations when alternately cold and hot, but particularly when covered with a material which prevents the moisture from escaping freely.

"Poor oils," says an eminent engine builder, "are a prolific source of injury, and often defeat the purpose for which a machine is intended."

One of the cardinal principles of boiler-setting should be to have everything in sight, or plainly get-at-able; so that if anything wrong occurs it shall be detected at once by inspection; and if it takes place, it may be properly and promptly fixed.—Robert Grimshaw's hints to power users.

Professor Mayer has calculated that, if the motion of the earth were suddenly arrested, the temperature produced would be sufficient to melt and even volatilize it; while, if it fell into the sun, as much heat would be produced as results from the combustion of 5,000 spheres of carbon the size of our globe.

It is stated by *Invention* that an Austrian chemist, Herr Eckstein, has discovered a substitute for celluloid, named hyaline, that is not inflamable. It is grainless, odorless, transparent, tenacious, and may be drawn into threads or rolled into films. It is described as composed of colophene, lac, copal, Dammara resin, essential oil of turpentine and gun cotton.

The revenue from patent medicines in Great Britain was $210,000, thirty years ago. Within a generation the government revenue from this source has increased five hundred fold, now footing up $100,500,000 annually.

An electro-magnet for the transport of iron castings has been in use for some time at Pittsburg, and at the exhibition at Frankfort is one capable of lifting a ton.

Owing to the rapid determination of steel sleepers in the neighborhood of salt water the Indian Government has decided that they are not to be used near the sea or over salt soil.

One of the recent inventions for life-saving apparatus is the pneumatic gun for throwing a line to a ship in distress or to persons in a burning house. The air is admitted from a reservoir to the chamber behind the projectile at a pressure of 2,000 pounds on the square inch.

Brass may be colored black by repeatedly coating the cleansed metal with a moderately warm solution of nitrate of copper. Heating over a charcoal fire follows. Finally the tone is heightened by rubbing with olive oil.

SANITARY LEGISLATION.*

Mr. President and Representatives of the Master Plumbers' Association of the United States.

GENTLEMEN:—What are the sanitary conditions of the plumbing trade throughout the country, and how can we better those conditions, is a matter which needs a good deal of study.

In the last twenty years look at the wonderful changes that have taken place, and as we move along from year to year the sanitary conditions are improved; so it is clear that there are means by which we can bring the trade to a state of perfection. As we proceed we find that organization is the best means by which we can establish the fact that plumbing and house drainage are the most important professions there are in existence. Doctors all admit that more than half the cases of contagious diseases are caused from defective plumbing and house drainage. When such is the case it is absolutely necessary to have laws passed governing the same, therefore, it becomes our duty to form State Associations and show to the Legislatures throughout the country the necessity of such. Of course these laws cannot be passed without injuring some, but, it will only be the incompetent and unreliable.

In looking over the different sanitary journals I notice attempts made in this direction, but, have failed, because they were made by only a few that knew the great necessity, and opposed by all that were incompetent and ignorant of the evils that arise from defective plumbing and house drainage which is done under the present state of affairs.

I do not wish to see those men injured financially, yet I would like to see them compelled to serve a sufficient time to learn how work should be done so that it would not be a constant danger to the people; such a law would not only be a protection to the people, but also to the man who has paid for his knowledge by serving years of hard labor, having attained a reputation that should be protected against men incompetent and illegitimately engaged in business they know nothing about.

There are about one-half the men engaged in plumbing and sewerage that do not give one thought to the sanitary conditions of the job they are doing, but are doing it to make money, and they consider nothing else.

Where there are no rules governing plumbing it is clear to be seen the kind of work that is done in tenement houses, where, as a general rule, the landlords are about as conscientious as the skin plumber, the conscientious and competent are forced into competition with this class of work.

Then, again, in cities where there are rules and regulations to govern plumbing and drainage they are not enforced on account of the blunders made in appointing men as inspectors who never served a day at the trade but are appointed on account of their political standing.

Cases of this kind exist all over the country, but I refer more to my own home (Cleveland, Ohio), where we have three inspectors who never served one day at plumbing or house drainage, but were promoted from sanitary patrol men to inspectors.

I have in my possession a petition signed by the plumbers of Cleveland before our last election asking that that department be filled with practical plumbers, which was endorsed by our Hon. Mayor, William G. Rose, and still the same order of things exist. There will have to be laws passed compelling them to do right or it will not be done. If a man wants to run an engine, he must pass an examination and get a license; if a student wants to practice medicine, he also must pass an examination before he can have a diploma; the same with a drug clerk and with the man practicing law, and a foreigner coming into this country before he is allowed to vote; but any of these men after failing in all those different branches can start in the plumbing business if he so desires without the least knowledge of the same, and yet there are more lives trusted to the mercy of the plumber than any other trade or profession.

An inspection of the death rate will show the great necessity there is for sanitary laws, and laws that will protect the lives of the people. In order to have our homes in good healthy condition, it is necessary to have them properly lighted, ventilated and heated. No room should be without a window. The plumbing should be ventilated in such a way that there will always be a circulation of air. Every fixture should be separately and singly trapped, every trap should be properly vented into some metallic stack that is always heated to carry off any gas or odor that might generate above the trap or in the fixture. All cast iron soil pipe should be extra heavy. Where wrought iron is used it should be extra heavy and galvanized especially for vent pipes. For wash tubs, baths, sinks, wash basins, &c., I would recommend lead waste pipes. Where lead and iron connects it should be done with brass soldering, nipples or ferules. All branches in waste or vent pipes should be made with a Y branch and all bend with ⅛ bends if possible. All joints in cast iron should be packed with oakum and calked with molten lead. All joints on lead pipes should be wiped joints. All drain pipes inside of buildings should be cast iron or lead. The sewer should be trapped before entering the building with a vent carried above the ground and furnished with a return bend with a perforated opening, the sewer carried back to fixtures and vented above roof and clear of all obstructions. When this is tested with a water pressure and shows no leaks I would consider it safe.

I would recommend leaving out all wooden fixtures, such as wash tub, sinks, &c., and all pan and plunger closets. I consider these fixtures incubaters of disease and not fit to be used in a barn.

All work should be left open. Wells and privy vaults should be condemned in cities where there are sewers.

To accomplish this we will have to form state associations and prevail upon the legislatures to enact laws governing such work and demanding practical plumbers for plumbing inspectors.

I might say a good deal more on this subject but will leave it to some of you who might have different and better ideas than mine.

*Paper read at the Cincinnati Convention of Master Plumbers June 24, 1891, by W. A. Kelly of Cleveland, O.

HOW TO FIGURE ON PLUMBING WORK.*

This is a calculating age. The era of *carte blanche* or go ahead and hang the expense is practically over in these prosaic times. The novelist gives in a bid to tap the main of his knowledge, put in so much soft solder in his love scenes, and so much cold villainy for so much money, and some of our imitation French realistic novels read also as if they were connected with the sewer. The lawyer now-a-days takes a great deal of his practice on a contingent fee, which is a contract to win a suit for so much per cent. Possibly some of our brethren have heard of damage or alleged boycott suits brought in this manner. And in a great many cases the lawyer gets very little but experience and soup. And even the physician in some cases agrees to use his knowledge, or the lack of it, for so much per year, and like the plumber, a great many of his mistakes are buried under the ground without the public being much the wiser. And while this system is attended with many evils, the necessity of a fair understanding is apparent to almost every person whose means are not practically unlimited.

Bringing this subject of contracting into our own craft, we all know how important it is that an owner, especially one who borrows some money in order to build, should know within a reasonable amount how much he is to pay for his plumbing before he starts to build. On the other hand how seldom it is that the owner of a building takes proper pains to take into account the general reputation for business integrity and skilled workmanship of the plumber he employs to do his work. A great many owners get a few catch phrases, such as "extra heavy pipe," "suck out," "wash out" or "knock out acting closets," and that great sanitary bugaboo "fouling surface." And while a conscientious architect may advise them not to try to get their plumbing too cheap, it is generally of no avail. But, as the old maid remarked: "All we girls have our troubles." They are in the business, and we can't change a bad system into a good one in a day.

The writer has started out to try to tell how to figure plumbing. First of all, read the specifications through carefully, if there are any specifications, and figure to do the job the way they are written. Don't guess at the intent of the specifications; you might get left, especially if you have never figured for the party before. For instance, a certain plumber figured on a set of specifications some time ago which called for a 6-inch extra heavy pipe running horizontally and out through the roof. He supposed, of course, it

*Essay read before the Master Plumber's Association of Kansas City, Mo., by Dent Yates.

was a mistake as the house was only a small one with one bath room, but he did not ask the architect; he was afraid to bother him, and he knew that four inches was absolutely large enough, and he thought the other plumbers would not know any better; so he figured on four inches and figured it close. He got the job, and much to his surprise and disappointment, the owner was an ex-tunnel contractor and wanted the pipe just that size. In vain our friend talked fouling surface, insufficient flush, etc. The ex-contractor closed his left eye knowingly, and said: "Me bye, that's what I used to tell the railroad company when my tunnel was too small, only I could not work the fouling surface gag." Result: our friend made no money on his job.

In the next place, read the specifications carefully so as to leave out nothing. Measure the length of soil pipe, vent and waste supply and safe waste pipes. Then the writer's plan is to have a schedule of trimmings to go with each fixture; for instance, each tank water closet, put up according to our city plumbing rules, which require 1¼-inch tee, ¼-inch brass ferrule, 15 pounds sheet lead, 6 feet 1¼ flush pipe, 8 feet ½-in. strong lead supply from tank to floor, 2½ feet 2-inch lead vent, and some other essentials such as tack solder, etc. These trimmings, I call them for want of a better name, I have carefully noted down in a small book the net cost of each item and the total cost of all the items. Then if the closet sets on a marble floor, or if any other variation from the standard way of putting up closets is used, it is vastly easy to deduct that particular item or set of items. The writer uses the same system with wash stands, an itemized schedule from cocks to solder, and the same method for bath tubs, sinks, urinals, and all other ordinary fixtures. It is readily seen that by having the net cost of the fixtures with the trimmings added to the floor line and the vents 2 feet 6 inches from the trap, that this method saves a good deal of small detail work and guessing besides saving a vast amount of time. If only one basin cock is used on a slab or some particular priced trap is specified, or some point of this sort comes up, it can be more readily taken care of in this way than in any other known to the writer; besides, this method does away with many uncertainties which some plumbers encounter when they figure soil pipe put up so much per foot, fixtures at list to allow for trimmings, etc. In the matter of trenching for sewer or water services the writer usually estimates the digging per foot as the soil is very even in this section. But the pipe is always figured at net prices. The last and most important point of all is, of course, the labor. There is, however, one point to be considered in figuring labor, which if not taken into account will bankrupt the wealthiest plumber. It is not how many days *can* the plumber do it in, but how many days *will* he do it in. It will not do to be too great an optimist on labor. Take men as you find them, then figure a fair day's work, and then see that you get it. But recollect, after you have figured all your lines of pipe, all your fixtures and labor, then comes the riddle like that propounded by the Sphinx of old: How much profit shall I add? And those who fail to answer it, like the older victims, will perish; the difference, however, is, the plumber will perish of starvation in place of the shorter death of being gobbled up. Before figuring the profit expected on a plumbing contract it is almost unnecessary to say that the items of material and labor should be closely looked over to see that nothing is left out or repeated. It is best, in the writer's judgment, to study the proposed job from water services to fixtures just as if he were doing this job himself in order to intelligently judge the amount of labor required on the work. It is always a good plan, also, to remember that 10 per cent profit on material and labor represents on a job of from $200 to $1,000 simply the shop expenses, allowing nothing for the master's expenses and time, and no plumber known to the writer ever made any money and kept it and stayed in business without getting from 25 per cent upwards on contract work including profits on extras of course.

Another thing, don't worry if some patent-leather plumber seems to be getting all the contract work in sight at cost or near it. He may dazzle your eyes with his new wagon and gilt sign; the traveling men may tell you that Skinner is a hustler; that he runs thirty-six men; that he has the Skylight flats and sixteen tenements in a row; don't let that sort of talk move you a peg. Do what little job work you can get, make your customers your friends, and make it a rule that if you cannot get the cost of your work with your living added, to let that job go and try another job. Discount your bills and remember the railroad rule in taking contract work: In all cases of doubt, take the safe side. Don't contract a job if you have any doubt whatever about getting your money. Don't imagine the mechanics' lien law will get you your money; it is little more than a bluff. A slippery lawyer and a slight technicality will put you in the position of the fellow that drove the hearse: He was not in it. Finally, the writer invariably goes over his work when it is finished to find out what the job did actually cost him. I believe that plumbers get tangled up, and into the clutches of the sheriff for the reason that they get half way through a lot of work they are losing money on, and get a lot more at the same price without knowing they are meeting their Waterloo when settlements become due.

The writer is aware that he has done this subject but little justice, but hopes that his efforts will bring out able discussion from other sources. If any of you know of any good rules, don't be a quack plumber, but let them be known for the good of the order.

CONVENIENT TO HAVE ABOUT.

Terra-cotta flue linings are a great improvement over the old rough-plastered chimneys.

Permanganate of potash dissolved in hot water makes the best possible water stain for floors to imitate dark oak or walnut. Size as usual after the stain is dry, and give two coats of best floor varnish.

In exchanging old lead for new, it is usual to deduct six pounds per cwt. from the gross weight of old lead before giving credit for it.

If cochineal is added to water in which lead is present, the water will turn of a purple color.

A red hot iron will, according to a contemporary, soften and remove the hardest putty from old ashes.

Grease can be taken out of marble by the application of fuller's earth or whiting, saturated by benzine.

According to the "Illustrirte Zeitung for Blechindustrie," a grayish black coloring on copper may be obtained by placing the object for treatment, after being well cleaned, in a weak solution of liver of sulphur. When a caustic effect has after a short time, been produced, the object is rinsed, slightly heated, and brushed with a stiff brush. This coating is said to be very durable.

A blackish brown bronzing can be applied to vases, figures, busts, etc., cast from zinc, by the application of a solution of sulphate of copper. If the projecting portions are then well rubbed with a woolen rag, they assume a coppery red brilliancy which increases the resemblance to genuine bronze. A solution of verdigris in vinegar also produces an effective bronzing.

Never clean brass work with acid, for it soon leaves it a dull color. Sweet oil and whiting, followed by a little soap and water, is best.

The best paint for galvanized iron where a dark color is not objectionable is common asphalt dissolved in turpentine or benzine. It is extremely tenacious, dries soon and becomes very hard and insoluble by the action of sunlight. It is flexible and very durable.

Good varnish, one-half gallon; boiled linseed oil, one-half gallon; add red lead sufficient to bring to the consistency of common paint. Apply with brush. Applicable to any kind of iron work exposed to the weather.

For varnish for bright iron work, dissolve three pounds of rosin in ten pints boiled linseed oil, and add two pounds of turpentine.

A coat of varnish made in the proportion of two ounces of shellac to nine ounces of alcohol, will prevent brass from tarnishing.

Gold varnish for ornamental tinware: Turpentine varnish, two gallons; turpentine, one gallon; asphaltum, one gill; umber, eight ounces; yellow analine, four ounces; gamboge, one pound. Boil and mix for ten hours.

An orange tint inclining to gold, is produced by first polishing the brass and then placing it for a few seconds in a warm neutral solution of crystallized acetate of copper; a grayish green by dipping into a bath of copper; a beautiful violet by immersing the

metal for an instant in a solution of chloride of antimony and rubbing it with a stick covered with cotton. An appearance vastly superior to that usually seen is produced by boiling the object in a solution of sulphate of copper.

DRIVEN WELLS FOR WATER SUPPLY.

In a paper recently read before the New England Water Works Association, says the *Engineering Record*, Mr. F. F. Forbes, Superintendent of the Brookline, Mass., water-works, stated that in certain localities where a water supply for a city or town must be obtained, the only practical way is to drive wells, for the reason that the upper layers may be of too fine material to admit of a filtering gallery working successfully, or the water-bearing stratum is too far below the surface for such form of construction.

The problem before one is to select such materials, and put them together in such a manner, that as the years roll by these wells will not become clogged with rust or fine material, and stop in part or entirely the flow of water. As regards the bottom piece of the well tube, into which the water from the surrounding gravel must flow, the usual way is to drill a certain number of holes of small diameter up and down the sides of the pipe, which is to form the bottom of the well, for a distance of two feet, more or less, according to the thickness of the gravel layer in which it is to be driven. The objection to this way is, according to Mr. Forbes, that these small holes are quite likely to rust up, this being hastened by the small gravel stones which are sure to partly fill them. To avoid this Mr. Forbes has adopted the practice of bushing the holes with ⅜ inch brass pipe as follows: The holes are tapped out, the brass pipe is screwed in till it is flush with the inside, then sawed off with a hack saw and left smooth on outside so as not to be injured by driving. The expense is not large, one man easily finishing three pipes in one day; and in one case the work was all done by the permanent men during the winter days, when time could be spared from hydrant inspection, etc., and so really cost the town little.

Concerning the horizontal part of the well, which connects the vertical part with the receiving suction main, or gravity conduit· Mr. Forbes says that this change in the direction is made with a tee of easy radius instead of an elbow. If the well is to be 2½ inches in diameter, into this tee is screwed a 3x2½ reducing coupling, and into the other end of this reducing coupling is screwed a piece of 3-inch cement-lined pipe of proper length and on to the other end of this 3-inch cement-lined pipe a similar reducer is placed, with a companion flange of a 2½ inch gate. This companion flange forms the union joint. From this valve to the main, a piece of lead pipe is used, or instead of the cement-lined pipe, lead could be used wholly.

This piece of lead will be found to be very convenient, for if the well is not driven exactly plumb—a very difficult thing to do in some material—or the fittings are not tapped straight, the work of connecting these wells air-tight without the lead will be almost impossible, also, in case there should be a slight setting afterwards, the lead will take care of it. The reason for the construction last described is to guard against rust. The horizontal part of the well, which is practically impossible to reach after the work is completed is composed either of lead, brass, or cement-lined iron—materials which are not likely to be effected soon by oxidation.

Into the tee, at the junction of the horizontal and vertical part of the well, an upright piece of pipe is screwed, reaching to the surface of the ground. There are two reasons for carrying this pipe to the surface. First, to clear the vertical part of the pipe, in case it should rust up; and, second, to examine the well at any time to determine whether or not the amount of water was decreasing. In the latter case, the valve between the well and suction pipe, or conduit, can be closed, and the well drilled, washed, and pumped out, as in the first place.

In discussing the paper Mr. A. F. Noyes, City Engineer of Newton, Mass., said:

"I have had flowing wells similar to what Mr. Forbes described, that have been flowing for 12 years. They were put in with common untarred and single thickness pipe, that is, standard thickness, and the holes were about ¼-inch holes reamed out on the outside to three-eighths. I anticipated I should have to clean them out every year for rust and other causes, but I have never had to put a rod into them, or a water-jet into them. This summer we had occasion to go to these wells, and they were flowing, so far as I could judge, with the same volume and in the same manner as they were when they were first driven. I intended, during the operation of the work, to draw some and see how the ends of the perforated pipe were; but we were so busy, and the work was following us so closely, I could not spare the men on the work till it was too late to attempt it. Well-drivers tell me that where these holes are reamed out on the outside, leaving a thin shell on the inside, any breaking away only tends to enlarge the holes. The way I have always intended to clear out these pipes was with a water-jet with a force pump, forcing the water-jet in through a gas-pipe with a drill-rod at the end, the water flowing around the end of the drill-rod, keeping the material stirred up, and it will force out a very large quantity. In fact, in some cases where I have driven into hard pan, and the flow of water was very weak, we have spent considerable time in drilling out; we have taken out a large quantity of hard-pan, washing it out, I should say, a barrel or more, and in some cases two or three barrels of the hard-pan has been washed out. It has undoubtedly left a coarser material in the cavity, and rather a large area, and in many of these cases we get a very considerable flow of water. But the well-drivers tell me invariably, and especially the older ones tell me, that their experience is, that this breaks away on the inside, and tends to enlarge the hole rather than to fill it up, and that they never have had any trouble on that point.

It has been a very serious study with me as to what class of pipe we should use in our work. We found from the results that the water of the Newton Water-Works acted very little on galvanized iron pipe; they have been in service for years, and there having been scarcely any injury on the inside, I decided to use galvanized pipe for the driven pipe. Extra heavy pipe was used for the points in this particular case, and the holes drilled, and it was galvanized afterwards, so that there was no fresh edge which was exposed. When the pipe was cut during the work, it was tarred over with a black varnish—a varnish which has stood very well on wrought-iron pipe. Of course, we have yet to see what the action will be, but that is the precaution I used in this particular case. I should be most afraid of putting in the brass ferrule, as Mr. Forbes has, from the observation I have had of service-cocks in connection with the main pipes.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

There are yet to be found men who make excuse for smoke on the ground that no smoke preventer has been produced that will operate successfully in preventing the nuisance. It has been proven that such devices exist and they have been seen in use. Experts have pronounced them successful, and every one observing the use of ordinary furnaces and the use of consumers, are convinced that the consumers do consume. It is observed that those who claim that these devices are not efficient are the people who make smoke, and in so doing violate the law every day. The same evidence that convinces the average citizen should be sufficient to convince the producers of smoke, but it does not seem to do it. There is a way, however, in which these men can be made to observe the law on the subject. There are devices produced in this city which have been proved successful. Manufacturers of these stand ready to prove the merits of their devices and will put up forfeit to pay all damages if they are not successful. They offer everything fair and reasonable. Let the proper officers convince themselves that these devices will abate smoke, and then enforce the law. They need not wait to convince smoke producers, for they do not want to be convinced. They want to go on producing smoke to the injuring of health and property regardless of all but their own selfish interests. When the officers, whose duty it is to enforce the law, becomes convinced that the smoke nuisance can be abated without placing heavy burdens on those now producing smoke, it is their plain duty to enforce the ordinances to the letter. This matter cannot be handled with gloves on, or with favorism in any matter. There is but one course to pursue, and that is the straightforward one under the law. If we wait until the tug owners, railroad men and building owners are ready to employ smoke consuming devices

on their own accord, we will wait till the smoke will annoy us no more in this land. It is not a question of what those men desire; it is what the public demands and it demands only that which can be accomplished. The matter stands just this way: We have an intolerable smoke nuisance, devices have been produced which will prevent the smoke; laws have been enacted for the abatement of the nuisance; officers are appointed and paid for the enforcement of these ordinances. What more is necessary? Here is all the machinery necessary, and the objections of smoke producers amount to nothing.

In reference to the tug-boat owners' objections, the Western Preventer Company of this city has answered them most vigorously and in a business way. This company offered to put its preventer on a tug and prove its efficiency at its own expense, but the tug owners would not consent. Thus we see that the opinion of smoke producers is not to be consulted or regarded. The interests of the people should receive attention regardless of all influences to the contrary. When such an offer is made as that of the Western Smoke Preventer Company and not accepted, there is nothing left to do but enforce the law.

The citizens should come to the Smoke Inspectorss' aid unanimously and support him in the enforcement of the ordinances. While he cannot sit still and rely on the citizens, the citizens should not withhold any aid in their power to give. The nuisance can be abated. There is no need of discussing that question. The duty before us is the practical application under the law of the means at hand. The cunning and tricks of the violators of the law must be learned, and nothing accepted but the adoption of means that will prevent smoke. That is the objective point, and with the many meritorious devices we have the attainment of it is not difficult and it need not be slow. It is of course not the work of a day. The smoke cannot be abated at once, but the results of prevention may be made appreciable daily. Close watching, promptness and industry will produce results clearly observable. Set the machinery in motion, let the citizens aid it, show no favors and take no back steps, and the work will move forward to the comfort of the people and the beautification of our great city.

MARYLAND PLUMBING LAWS.

In his report at the late convention Mr. Dunnett, state vice-president, referred to the plumbing laws of Maryland, which are as follows:

Sec. 1. Be it enacted by the General Assembly of Maryland, That it shall not be lawful for any person, persons, firm or corporation engaged in the plumbing business in the City of Baltimore to employ as workmen in said business any person or persons, except those qualified to work as registered plumbers; and no person shall be qualified to work as a registered plumber unless said persons have made application and received from the State Board of Commissioners of Practical Plumbing a certificate of competency and has complied with the provisions of this Act.

Sec. 2. And be it enacted, That if any person or persons after the passage of this Act shall engage in or work at the plumbing business in the City of Baltimore without first complying with the provisions of this Act, such person shall be deemed guilty of a misdemeanor and subject to a fine of fifty dollars for each and every violation of said Act, said fine to be sued for in the name of the State and before a Justice of the Peace of said city.

Sec. 3. And be it enacted, That the Governor shall appoint biennially five persons, who shall constitute a Board of Commissioners which shall be known and designated as "The State Board of Commissioners of Practical Plumbing," and who shall be selected as follows: Three persons who are practical and skilled plumbers from the City of Baltimore, the Commissioner of the Board of Health of Baltimore City, and a member of the State Board of Health from the State at large, whose duty it shall be to faithfully and impartially execute, or cause to be executed, all the provisions and requirements of this Act; that they shall upon application and in such manner and at such place as they may determine, provided said place of examination shall be within the limits of the City of Baltimore, examine each and every person who shall desire to work at the plumbing business, touching his competency and qualifications; and upon being satisfied that the person so examined is competent and qualified to work at said business, they, or any three of them, shall grant such person a certificate of competence, under the provisions of this Act, and register him in their books as a practical plumber, which shall operate as full authority to him to conduct and engage in the said business of plumbing.

Sec. 4. And be it enacted, that the Commissioners appointed uuder this Act shall hold their several offices for the period of two years, without compensation, commencing from the first day of May next succeeding the date of the passage of this Act, and thereafter until their successors have been appointed and qualified; said Commissioners shall, within thirty days after notification of their appointment, each subscribe to an oath before the Clerk of the Superior Court of Baltimore City, to impartially and faithfully discharge the duties prescribed by this Act; a failure to so qualify on the part of any appointed, within the time and manner named, shall create a vacancy, which the Governor shall immediately proceed to fill by the appointment of some other skilled practical plumber or qualified person under the provisions of this Act; as also in cases of death or resignation.

Sec. 5. And be it enacted, That the said Board of Commissioners shall demand and receive from each applicant for a certificate of competency, whom they examine and pass, the sum of three dollars at the time of the issuance of said certificate, and the sum of one dollar for the renewal thereof each and every year thereafter, on or before the first day of May; provided, that no person who shall be engaged in the general plumbing business at the time of the passage of this Act, shall be required to make application for such certificate of competency for the period of one year from the date of passage of this Act, commencing with the first day of May next succeeding the passage of this Act.

Sec. 6. And be it enacted, That the money received under the provisions of the foregoing section shall be used and applied by said Commissioners to defray the expenses accruing or arising under this Act, and all surplus over and above the necessary expenses under this Act shall be returned to the State Treasurer for the use of the State.

Sec. 7. And be it enacted, That the said Board of Commissioners are hereby empowered to make such rules and regulations from time to time for the proper execution of the provisions of this Act as in their judgment they may deem necessary and requisite; and they shall be required to make a report of the condition of the Board to the Governor biennially, on or before the first day of February.

Sec. 8. And be it enacted, That this Act shall take effect from the date of its passage.

Approved April 22, 1886.

FOR THE DIGESTION.

Is the Cherokee Strip decollete territory?—*Washington Star.*

Revivalist—"Young lady, which road will you elect, this night to follow?" Young lady (blushing)—"I—I'd rather the bridal path."—*New York Herald.*

If the man who crosses his legs when he sits in a street car could be put upon his mettle you would find that it consists largely of pig iron.—*New York Recorder.*

After you have fallen into a pit you begin to hear from your friends of the many paths you might have taken that would have led you safely around it.—*Atchison Globe.*

Squeers (at the circus)—"Look at Pennibs! See how he starts every time the ringmaster flourishes his horsewhip?" Nickleby—"Yes; Pennibs used to edit a society paper, you know."—*Boston News.*

Watts—"At what age would you say a woman ceases to be fascinating?" Potts—"Before I answer that question tell me how young a boy am I allowed to consider in the case?"—*Indianapolis Journal.*

She (fishing for compliment)—"Do you think my voice needs cultivation?" He (anxious to pay her a compliment)—"Not at all. Cultivation couldn't improve a voice like yours."—*New York Press.*

She—"Darling, go and get that beautiful bit of sea-weed for me, won't you?" He—"My dearest, I'd get my feet wet." She—"And yet before marriage you said you'd go through fire for me."

He—"But I honestly leave it to you. Did I ever say anything about water?"—*Philadelphia Times.*

It is painfully astonishing how the soft yellow gold in a sweetheart's hair gets mixed into a peculiarly red alloy in a wife's hair. —*Washington Star.*

One half of the world does not know how the other half lives—nor in many cases would the former half be willing to have it known how it lives.—*Life.*

Some one asks "what is the hardest thing in the world to keep?" It's a toss up between a $5 bill that has been broken and the pledge.—*New York Recorder.*

"How did Wall street get its name. There's no wall there." "Yes, there is. I went to it about a month after I began to speculate."—*Smith, Gray & Co.'s Monthly.*

Uncle Treetop—"I heard that your son out West was coining money." Heigh Seed—"He was until the government competition got too strong for him."—*New York Herald.*

"Where shall you spend your vacation?" "I've half a notion to take a trip to the place of endless spring." "Where is that—Los Angeles or Waterbury?"—*Indianapolis Journal.*

"Justice is the Goddess of Music, isn't she!" asked one Congressman of another. "Certainly not; what made you ask such a question?" "Well, she is commonly supposed to run the scales, you know."—*Washington Post.*

Gabriel—"What do you think of these religious rows on earth, St. Peter?" St. Peter—"O, the arguments on both sides are interesting. The writings of both parties remind me of the average Englishman's impressions on America."—*Puck.*

PLUMBING NOTES.

If you do not make a profit, remember you are on losing ground.

Some of these days some one will make a joke on plumbers' bills and die. It is generally those who are looking for cheap work who are all the time in a fever heat about bills.

The Pueblo *Chieftain* gives the following concerning one of Pueblo's plumbing firms: Pueblo can boast of the largest, best appointed and best conducted plumbing establishment in the state. We refer to the fine establishment of Morgan & Geiser, located at the corner of Richmond and Union avenues, opposite the Board of Trade building. Messrs. Morgan & Geiser are practical men in the business, and personally superintend all work entrusted to them, which accounts in a large measure for their success and for the satisfaction which their work affords their patrons. They carry the biggest and best stock of plumber's supplies and goods of all kinds in the state, and invite an inspection of their store and stock by all strangers and others in the city. They figure on all kinds of plumbing and sewer work promptly, and make a specialty of sanitary sewerage for residences and public buildings.

Don't be afraid that if you do not bid low you will not get a contract. No man will build a house and finish it up with no plumbing in it because he cannot get the job done for nothing, and if you do plumbing work once below a reasonable price you will be expected to do it again.

The firm of Burnside & Kehoe, plumbers, steam and gasfitters, have dissolved partnership by mutual consent. John Burnside will continue in the old stand, 611 Locust street, pay all bills due by the firm and collect all bills due the firm.

The public is becoming better informed regarding the value of good plumbing every day. The day will come when the price will become less of an object than the quality of plumbing work.

The Cameron Water Works Construction and Plumbing Company of Memphis, Tenn., have made an assignment.

The London (Ont.) *Echo* says: "A petition regarding journeymen plumbers which is to be presented to the city council is in circulation. The object is to require all men working at the trade to have certain qualifications, which will entitle them to a license, thus shutting out certain tinkers, etc., calling themselves plumbers, from imposing on the public. In this connection we would advise the appointment of a qualified plumbing inspector, such as other large cities have, whose duty would be to look after work generally. If the aldermen have privately had much to do with plumbers they will no doubt see the necessity of giving the screw a much-needed turn."

Mr. A Donnerberg, of the firm of Donnerberg & Co., Portland, Ore., called in The Sanitary News office last Saturday on his way home from an extensive trip through the East and Canada. Mr. Donnerberg was a delegate to the Cincinnati Convention, upon the adjournment of which he started on his tour visiting the principal cities through the country through which he traveled, and the extent of his journey can be imagined from the fact that he was through Chicago last week on his return trip. He is an observing traveler and from his trip has gathered much information which will be put to practical use, as he is an energetic, enthusiastic gentleman. He reports the Portland Association in good condition, and with a fair prospect of having plumbing regulations and a practical plumber for inspector at an early day. Mr. Donnerberg has succeeded his father, who has retired, to the head of a prosperous plumbing business, and his intelligent direction of affairs continues his success. He is a young man full of spirit and enthusiastic in the cause of sanitary plumbing.

Mr. D. Mayfield, of Savannah, Ga., writes us that the journeymen plumbers of that city have formed a local association and wish to attach themselves to some strong organization. The Savannah association is in a flourishing condition, and is styled the Savannah Plumbers', Steam and Gasfitters' Union No. 5,475. They are starting out enthusiastic and promising. Following are the officers: President, A. A. Linzer; Vice-President, B. F. Morgan; Secretary, D. Mayfield; Treasurer, J. J. Murphy; Guide, W. Paul; Guard, T. G. McMade.

In regard to tinners and tinkers doing plumbing work, the objection is not so much against their mechanical skill as against their scientific knowledge of the art. Some suppose that anyone who can do good mechanical work can do good plumbing. This is a great mistake. A plumbing job can be mechanically perfect and wholly imperfect from a sanitary point of view. It cannot be expected of tinners that they possess this scientific knowledge for it does not come within their line of work, but it is the first essential in good plumbing work.

We are receipt of the following letter: Mr. Andrew Young: At a regular meeting of the Journeymen Plumbers' Protective and Benevolent Association held July 13, 1891, you were unanimously endorsed for the position of Chief of Bureau of Sanitary Plumbing under Chief of Division of Liberal Arts at the World's Columbian Exposition. Wishing you every success, I am, fraternally yours,

John J. Meanry, Recording Secretary.

Ritter & Burke, 7, 90 La Salle street, Chicago, report the sale of two of their smokeless furnaces to the New York Life Insurance Co. These furnaces are to be applied to two Babcock and Wilcox boilers 156 horse power each, now being reset in their building in St. Paul, Minn. They have also closed a contract with the East Atlanta Land Co. for four smokeless furnaces to be applied to four Harrison safety boilers, 80 horse power each, about to be placed in their new equitable building in Atlanta, Ga. It is noteworthy of Chicago enterprise to find three Chicago firms doing the principal work on this building. Burnham & Root are the architects, Geo. A. Fuller Co. are doing the construction, and Ritter & Burke are placing in their smokeless furnaces.

During our absence Mr. Dent Yates of Kansas City dropped in and left his John Hancock on our table. We are sorry we were not present to meet this sanitary enthusiast, but are thankful he has not forgotten us. We publish this week an article from him on "How to Figure on Plumbing Work," and next week we will publish an article from him entitled "A Kansas City Pilgrim in Chicago." This article shows that the "Pilgrim" did not have his eyes shut while among us or his feet tied. Mr. Yates expects to visit our city again, and if he will inform us of his approach we will be in and have a seat prepared for his use.

On returning to our office one day this week we found the card of James M. Healy of Indianapolis. We regret our absence at this time for Mr. Healy is a man good to meet in any capacity. He is one of the staunch, reliable plumbers of Indianapolis, and we wish all our readers had the pleasure of his acquaintance.

WHERE PLUMBING WORK IS BEING DONE.

63 Aberdeen street, J. W. Plumstead; Atlantic, bet. Fifty-sixth and Fifty-seventh, J. W. Plumstead; Ashland avenue, near Blackhawk, F. Falk; 4084 Atlantic, L. Levy; Atlantic and Fifty-second, J. W. Plumstead; Albany ave. near Twenty-third, Steiner & McFarlane; Barkley ave. and Division, D. J. Tierney; Bingham, H, Breyer; Berkley ave. bet. Forty-fourth and Forty-fifth, R. Lear; 3745 Bloom, Steiner & McFarlane; 861 Central Park ave., John Connell; 2939 Canal, M. Weber; 50 Clark, C. T. Kleutz; Commercial ave., Brunt Bros.; Clybourne Place near N. Robey, H. Breyer; Chambers, near Sixtieth, J. Sanders; 388 Centre ave., Love & Welch; 208 Clark, G. Fehr; Cornelia ave., Harvey & Mose; 3035 Deering, Colter & Son; 817-647 Dania ave., Harvey & Mose; 5633 Dearborn, A. C. Pagel; 802 Eighteenth, C. Kostlevy; Eighty-sixth Place near Vincennes ave., J. Gannon; Emerald ave. bet. Sixty-fifth and Sixty-sixth, Conway; 3631-35 Forest ave., Wm. Bowden; Fletcher near Paulina, P. H. McCabe; Forty-seventh bet. Evans and Langley avenues, R. H. Lear; Fifty-ninth, near Emerald ave., Dewar & Co.; 222, 228-32 Fairview ave., Harvey & Mose; Flournoy & Francisco, Harvey & Mose; Greenwood ave. bet. Prescott and Center, S. Delcher; 640 Holt, H. Breyer; 853 Hancock, H. Breyer; 347 Harding, I Wilne; 72 Humboldt ave., Nelson & Celhoffen; Hope near Seventy-fifth Dewar & Co.; 7038-40 Honore, Dewar & Co.; 3606 Honore, Steiner & McFarlane; 427 Irving ave., Hamblin Plumbing Co.; 177 Illinois, E. Sheehan & Co.; James Place, Jno. Doyle; Kimball near Milwaukee aves., H. Breyer; Kedzie and Portland, Harvey & Mose; Lake ave., near Fifty-sixth, J. J. Rourke; Logan near Wallace, J. Gannon; 459-61 LaSalle ave., Geo. Cross; Lafayette near Sixty-ninth, J. H. Bradley; 180 Liberty, Love & Welch; Lincoln, bet. Forty-fifth and Forty-sixth, C. Kostlevy; 1165 Maplewood, H. Breyer; 1267 Monroe, Jack; 6044 Morgan, Dewar & Co.; 862 Maplewood, Harvey & Mose; Nebraska, north of Webster ave. Geiss; Oak ave. near Vincennes, R. H. Lear; 888 Oakley ave., Harvey & Mose; Park ave., Avonsdale, H. Breyer; 2251 Park ave., C. E. Jurgens; 3530 Portland ave., M. Weber; 399 Polk, Love & Welch; Park ave. near Thirtieth, Foskett & Brown; Robey, north of Division, H. Breyer; 7278 Reynolds ave., J. Gannon; 182 Richmond, Harvey & Mose; 4412 Sherman, William Whelan; Sixty-fifth and Evans ave., G. Feldkamp; 30 String, G. Fehr; 8555 Superior ave., Brunt Bros.; Sixty-fourth near McChesney, Herzog; State bet. Forty-seventh and Forty-eighth, P. Schmitt; Sawyer ave., C. Kostlevy; Stewart and Seventy-third, Dewar & Co.; 4401-03 State, Foskett & Brown; 1034 Thirty-first, Colter & Son; 551 Twenty-eighth, M. Weber; 1130 Twelfth, Baggott & Golk; Twenty-sixth and Washtenaw ave., Steiner & McFarlane; Twenty-fourth and Wabash ave., J. L. Emblem; 376 Thomas, C. F. Klentz; 5615-19 Winter, P. Stewart; 5137 Winter, P. Schmidt; Wilcox ave. near California ave., M. C. McDonald; 1414 Wabash ave., Nash & Hana; 349 Warren ave., Love & Welch; Winard and Milwaukee ave., L. Deckert; 1024 Whipple, C. Kostlevy; Winter south of Eightieth, C. Kostlevy.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

New York City, N. Y.: A report was submitted by the Committee on Buildings of the Board of Education last Wednesday recommending that plans be invited from architects for the proposed new building to be erected at the southwest corner of Fifty-ninth and Park avenne. It is proposed to construct a 5-story and basement building to cost between $300,000 and $400,000. Frank Wennemer has plans for a brick and stone church and parsonage, which the Blinn Memorial Methodist Episcopal Church will build on Lexington avenue on a plot 56x100. The fronts will be of long meadow stone and Philadelphia brick, the size 45x98, and the cost $60,000. Thom & Wilson have plans for five 5-story tenements, the corner 21x96.8, and the others each 25x70 and extension, to be built by Feehan & Hammer, on the northwest corner of Avenue B and Eighty-seventh street. G. A. Schellenger has plans for a 5-story flat, 25x89.6, to be built on the north side of Ninety-eighth street, 150 feet west of Central Park West, for G. A. Kelly. Ed. Wenz has plans on the boards for a 5-story flat, 25.2x96, to be built on the northwest corner of Park avenue and Ninty-fifth street, for N. J. Reville, and three 5-story flats, 25x88 each, on the north side of Ninety-fifth street, 100 feet west of Park avenue, for the same owner, the whole to cost about $100,000. Richard R. Bavis has drawn plans for a 4-story brick and stone stable, 50x100.11, to be built by Frederick Hulberg, on the south side of One Hundred and Twenty-second street, 60.1 feet west of St. Nicholas avenue, at a cost of $18,000.——Chicago, Ill.: The estate of B. F. Tobin will erect a 6-story apartment house, 73x123, at the southeast corner of Cottage Grove avenue and Thirty-third street, after plans by E. R. Krause; cost, $100,000. John Addison has planned a church, to be known as the Porter Memorial Church, to be built at 500 Paulina street by the Union Park Congregational Church. It will be 73x102, and will be constructed of stone and frame; cost, $10,000. The same architect has planned a 3-story stable, 25x73, for Mrs. Annah B. Peck, to be built at 2446 Michigan avenue; cost, $7,500. Beers, Clay & Dutton have completed plans for a 2-story and attic brick and frame residence for J. S. Dickinson, to be built at Evanston; cost, $10,000. J. E. O. Pridmore has completed plans for a 4-story and basement apartment house, 100x63, to be built at the corner of Oakenwald avenue and Forty-third street, by O. P. Spencer; pressed brick with buff stone trimmings and hardwood interiors; cost, $40,000. J. A. Miller has planned a 4-story and basement flat building, to be erected on North State street, between Cedar and Elm streets, by William Seymour; cost, $50,000. For the same person he has planned an additional story and the reconstruction of the building at 408 Elm street. J. A. Shain has prepared plans for five 3-story and basement residences, to be built at Ellis avenue and Sixtieth street by J. W. Cassell to cost $50,000. The same architect has designed a 3-story and basement residence for A. Fisher, to be built at 4517 Greenwood avenue; pressed brick construction with hardwood interior; cost, $24,000. He has also designed a 3-story residence for H. G. Bird, to be built at 4519 Greenwood avenue. It will be constructed of frame with fine hardwood interior, and warmed by hot water; cost, $18,000. Fred. Olschlager has planned for T. E. Lyons a 3-story and basement store and flat building, to be erected at 6138 Halsted street. It will be constructed of pressed brick and stone; cost, $18,000. He has also planned for M. Bruhus a 2-story store and flat building, to be built at Sangamon and Sixty-first streets. F. B. Townsend has planned a 2-story attic and basement residence for F. H. Day, to be built on Belmont avenue. It will be constructed of frame with stone basement. C. L. Stiles & Co have designed a 4-story and basement flat building, 50x80, for George M. Hoord, to be built on Fifty-first street near Washington avenue. It will be constructed of cut stone with an elaborate entrance in marble and tile; cost, $25,000. For Dr. M. S. Johnson, the same architects have planned two 3-story buildings, 40x68, to be built on Washington avenue near Fifty-fourth street. They will be constructed of stone with hardwood interior; cost, $14,000 They have also planned two additions, one to the National street school and one to the Hill street school, at Elgin, Ill. They will be constructed of pressed brick and stone and will cost $13,000 each. J. F. & J. P. Doerr have completed plans for a 3-story store and flat building, 25x70, to be built at Thirty-first street and Parnell avenue, by M. Kohnert. It will be constructed of pressed brick and brown stone; cost, $7,000. Also a double 4-story and basement apartment building for C. A. W. Platt, to be erected on Berkeley avenue north of Forty-fifth street. Pressed brick and terra cotta construction; cost, $15,000. They have also let contracts for the erection of a 3-story and basement building for R. Reidy, to be built at Thirty-first street and Armour avenue. It will be 50x85, and constructed of buff stone with pressed brick and stone trimmings; cost, $25,000. Also for Joseph Stein a 3-story and basement residence, to be built on Forest avenue near Forty-seventh street. It will be constructed of stone with hardwood trimmings; cost, $25,000. They have also planned a 3-story flat building for Louis Mohn, to be built at 5437-5439 Lake avenue. It will be constructed of buff Bedford stone with Georgia pine interior; cost, $15,000. Holabird & Roche have completed plans for a new station at Sheridan Park on the St. Paul railroad. It will be 300 feet long and will cost $15,000. Dahlgren & Lienendahl have planned a double 2-story apartment house, to be built at Ravenswood. It will be constructed of pressed brick and stone. For H. G. McCartney they have planned four frame houses, to be built on Atlantic near Fifty-second street; cost, $7,000.——Phila-

delphia, Penn.: Nine dwellings will be erected on the east side of Maschar street north of Lehigh avenue by Fred Franks. The contract for the erection of Carl Lauber's new 5-story building on the west side of Ninth street south of Filbert, has been awarded to C. B. Prettyman. Architects Constable Bros. will superintend the work. F. L. &. W. L. Price have plans for a fine residence for Mr. Monroe Smith, to be built at Thirty-ninth and Chestnut streets. Hazelhurst & Huckel have plans for a parsonage to be erected for Park Avenue Methodist Church, to be Gothic in architecture, 3 stories high and built of stone. Albert W. Dilkes has plans for alteration and addition to house of David Flemming, at Harrisburg, Pa. Also plans for two wings, to be attached to public school at Coatesville, Pa., each to be two stories, brick, with stone trimmings. Also plans for additions to residence of Mr. William H. Gibbons, of Coatesville, Pa. J. E. & A. L. Pennock are inviting bids from sub-contractors upon the plans for a new store to be built for J. J. Seeds. The congregation of the Catholic church now worshiping at Tinicum avenue and Bell road will soon build a new edifice. Philadelphia contractors are bidding upon the extensive alterations to be made to the residence of Mrs. S. H. Mayers, at Bethleham, Pa., and the new recitation hall for Delaware College, the plans for which have been prepared by Architects Furness, Evans & Co., of this city. A large mill will be built at Manayunk for A. Campbell & Co. A handsome 5-story store will be erected on the site of 1332 Chestnut street by the trustees of the Brown estate. The building will have a frontage of 33 feet and will extend in depth a distance of 227 feet. Jno. T. Windrim has asked bids for the construction of the new residence to be erected for Hon. Edwin S. Stuart, mayor, at the northwest corner of Broad and Tasker streets. The main structure will be of brown stone, three stories high. The estimated cost is from $18,000 to $25,000.——Cincinnati, Ohio: S. Hanaford & Sons have plans for an office and printing establishment for the Times-Star Company, Walnut street near Sixth, to be eight stories, built of brick and stone; cost, $50,000. The same architects have prepared plans for a residence for S. F. Dana, Avondale, O. To be built of brick and stone; cost, $15,000. H. E. Siter has plans for remodeling a residence for Geo. W. Hamilton, Fifth and Greenup streets, Covington, Ky.; to cost $9,000. J. H. Havlin, 157 Central avenue near Fifth street, will erect a theater to cost $100,000. George W. Vogel has plans for a warehouse to be erected at Prestonville, Ky., for E. Block & Son, Cincinnati. To be built of brick and stone; cost, $15,000. J. G. Steinkamp has plans for six residences for Thos. Emery's Sons, Cincinnati. To be 2½ stories, built of frame; cost, $15,000. Rieg & Marty have plans for a brick store building for G. Wildermuth, Pomeroy, O. To be 2 stories, built of brick; cost, $12,000.——San Francisco, Cal.: Col. J. M. Wood will prepare plans for the new theater to be erected at Stockton, Cal. C. R. & J. M. Wilson have completed plans for a 4-story frame building to be built on Sutter street near Taylor; cost, $35,000. W. H. Lillie has completed plans for a frame cottage of 12 rooms, 2-story and basement for Mrs. M. E. Redmond; cost, $21,000. Plans have been completed by Samuel Newsom for a residence to be erected by C. E. Bancroft on Green street near Scott; cost, $6,000. M. Bugbee has drawn plans for a frame dwelling in Ross Valley; cost, $6,000. He has also drawn plans for a frame dwelling to be built in San Rafael; cost, $6,000.——Washington, D. C.: T. F. Schneider is preparing plans for the new Episcopal Church, of which Rev. J. A. Aspinwall is to be the pastor, and which will soon be erected at the southeast corner of Eighteenth street and Madison place; the design submitted is for a 1-story structure of rustic appearance, 22x98, built of blue stone and red brick. Charles A. Harkness has been commissioned by Mr. J. C. O'Gorman, president of the Potomac Electric Company, of Georgetown, to prepare plans for an inn that will be built on the high bluff west of the Virginia end of the Chain Bridge and overlooking that structure; it will be 39x44, two stories, attic and cellar in height, with blue stone base and frame above; the cost will be $12,000. Mr. T. W. Bedford will shortly erect a block of 11 dwelling houses at the southeast corner of Twenty-second street and Ward place from plans now being prepared by Charles E. Burden; they will be 16x45 in size; the cost will be $26,000. Mr. J. H. Merriwether will have built at the northwest corner of Twelfth and U streets a block of seven dwellings from plans now being prepared by Architect N. T. Haller; they will be 17x36, two stories and basement high.——Detroit, Mich.: G. W. Lloyd is preparing plans for the Woman's Hospital and Founding's Home, to be erected on corner of Forest avenue and Beaubim street. It will be of brick, stone trimmings and slate roof, and will cost about $50,000. The same architect is preparing plans for the buildings of David Whitney, Jr., recently burned on Larned street. Rogers & Macfarlane are preparing plans for a block of 3-story brick residences, to be built on southeast corner of Howard and Fifth streets for Robert Murray; cost, $15,000. The same architects have completed plans for a 2-story frame summer residence being erected at St. Clair Flats for Gen. R. A. Alger; cost, $6,000. Mason & Rice have finished plans for a 2-story brick and stone residence for John Owen, to be built on Jos. Campau avenue; cost, $10,000. The same architects are preparing plans for the remodeling and enlarging of a brick residence for Francis F. Palmo, to be built on south side of Jefferson avenue, between Rivard and Russell streets. Jos. E. Mills is preparing plans for the Criminal Insane Asylum at Ionia, Mich. To be of brick and stone trimmings, 118x124, and cost $25,000. A. E. French is preparing plans for a 2-story brick residence on west side of Cass avenue for Nathaniel J. Hubbell; cost, $9,000. Donaldson & Meier are preparing plans for a 2-story brick school house for the St. Elizabeth R. C. Church, to be erected on southeast corner of McDougall and Canfield avenues; cost, $7,100. Edward C. Van Leyen has completed plans for a 2-story brick residence for Frederick W. Kellogg, to be erected on Kirby avenue near Woodward; cost, $10,000. The same architect is preparing plans for a 2-story frame residence for C. R. Clark, of Port Huron; cost, $5,500. Mortimer L. Smith & Son have completed plans for repairs to Campau building, recently burned, at corner Griswold and Larned streets. E. W. Arnold is preparing plans for gymnasium for the Ann Arbor University. Brick and stone trimmings, and cost about $45,000. A. C. Varney & Co. are preparing plans for a 4-story brick block for Jas. W. Dailey, to be built on the northwest corner of Michigan avenue and Park place; cost, $25,000. The same architects are preparing plans for a 3-story brick shoe factory for H. S. Robinson & Co., to be built on Lafayette avenue near Seventh; size, 40x80; cost, $8,000. Spier & Rhons are preparing plans for a frame building for the Trinity German Lutheran Church Society at the corner of Medbury and Duboise avenues; cost, $8,000. The same architects are preparing plans for a frame church for the Gethsemene Lutheran Church, to be erected on Twenty-eighth street near Rich street; cost, $8,000.

SEWERAGE NOTES.

Cambridge, Mass.: An appropriation of $15,000 has been made for sewers.——Springfield, Mass.: Mr. Rudolph Hering's report on the sewerage system has been presented.——Clinton, Mass.: An appropriation of $10,000 has been asked for sewers.——Meriden, Conn.: T. H. McKenzie, of Southington is preparing plans and estimates for a sewerage system, including sewage disposal by irrigation and filtration through land.——Huntington, W. Va.: City Engineer Thornburg has prepared plans for about 5 miles of main and branch sewers, and the city will advertise for bids.——Mansfield, Ohio: A Waring system of sewerage is to be put in.——Hamline, Minn.: The sewerage question is being strongly agitated.——Sioux City, Ia.: It is proposed to extend the sewerage system at a cost of $765,000, to carry the waters of Perry Creek into the Missouri river.——Missoula, Mont.: Surveys for a sewerage system are being made by City Engineer Reardon.——Portland, Ore.: Contracts are to be let for the Thomas Creek and Tanner Creek sewers, at about $32,000 and $41,000 respectively.

HEATING AND LIGHTING.

New Electric Light plants or extensions are reported as probable in Providence, R. I., address the Narragansett Electric Co.; Baltimore Md., address the Jarvis Conklin Mortgage & Trust Co., of Kansas City, Mo.; Batesville, Ark.; Bethany, Mo.; Madison, Ind.; Fort Hunter, N. Y., address E. Howard & Son; Luling, Tex.; Lachine, Ont.; Allentown, Pa., address the Electric Light & Power Co.; Washburn, Wis.; Ishpeming, Mich.; Pioche, Nev.; Ashville, Ala., address J. A. Hodges; Yazoo City, Miss.; Loveland, Colo.; Manchester, Va., address H. S. Bradley, Baltimore, Md.; address the Park Commission; Florence, Ala., address W. P. Campbell.——Waterville, Me.: The town has appropriated $20,000 for a municipal plant.——North Attleboro, Mass.: At a town meeting it was decided by a large majority of votes to construct and operate a municipal plant.——The following electric light

companies have been formed: Columbian Light, Heat & Power Co., Chicago, Ill.; capital stock, $3,000,000; incorporators, N. A. Partridge, S. E. Moore, J. Irvine. National Light, Heat & Power Co., Chicago, Ill.; capital stock, $100,000; incorporators, H. M. Angle, C. Arnold, P. E. Crissey. Kennebunk (Me.) Electric Light Co.; capital stock, $100,000; President, S. T. Fuller; Treasurer, F. M. Ross. Central Construction Co., Newport, Ky.; capital stock, $500,000; W. W. Taylor, of Philadelphia, Pa., is an incorporator; object, construction of water works, electric light plants, etc. Westfield (N. J.) Investment & Improvement Co.; capital stock, $50,000; incorporators, M. Welles, J. H. Vail, W. G. Delamater and others; object, construction and operation of an electric station. Millville (N. J.) Electric Co.; capital stock, $50,000; incorporators, W. D. Kemble, G. B. Langley, W. Wood. Crescent Electric Light Co., Long Island City, N. Y.; capital stock $25,000; directors, G. Gray, Jr., E. P. Foster, H. A. Fisher, Jr.

WATER WORKS NOTES.

Lowell, Mass.: The Water Board have voted to ask the Council to appropriate $60,000 for the introduction of a Jewell filtering system.——Lynn, Mass.: The Board has been authorized to extend a 20-inch main through 6 streets.——Freeport, Me.: The Freeport Water Co. has been organized with a capital stock of $50,000, with E. B. Mallett, Jr., President, and W. H. Soule, Treasurer.——Farmington, Me.: The Farmington Water Co. has been incorporated; capital stock, $50,000.——Jamestown, N. Y.: The *News* is in favor of building city works. The present works were built in 1882 by a company.——Mayville, N. Y.: Works are still being discussed. G. E. Leet is Secretary of the Water Commissioners.——Hanover, Mass.: The Hanover Water Co. has been incorporated by J. Dwelly, L. Phillips and H. H. Platt, with a capital stock limited to $60,000.——Gorham and Standish, Me.: The Standish Water & Construction Co., of Portland, has been incorporated to supply these and other places.——Livingston Manor, N. Y.: Charles H. Smith, Middletown, is making surveys for a reservoir here.——Reading, Pa.: The vote on a $150,000 loan for new mains will be taken July 15.——Lyndon Centre, N. Y.: New works are projected.——Foxborough, Mass.: The district has voted $75,000 of bonds for works. G. F. Williams is clerk and F. L. Fuller Engineer.——Waynesborough, Va.: The Waynesborough Street Railway, Light & Water Co. has been incorporated by W. W. Fishburn, R. T. Wright and W. B. Gallagher; capital, $100,000. It is reported that 3 miles of 8 to 4-inch pipe will be wanted.——Wytheville, Va.: It is reported that the town will put in a 5-mile supply main from springs on Lick Mountain.——Mannington, W. Va.: J. M. Blackshear is one of the incorporators of the Mannington Water Supply Co.——Plymouth, Mich.: Contracts for works will soon be let. The system will be direct pumping.——Grand Rapids, Mich.: A $300,000 loan has been granted for a new supply from driven wells and for 33 miles of new mains. F. A. Tramley is secretary.——Union City, Tenn.: Plans are being made and bids will soon be asked for a light and water plant to cost not over $60,000. Wells, a pump and standpipe are proposed. W. G. Alexander is Chairman of Water Board.——Bellaire, Ohio: H. G. Wilson, General Manager, has asked for bids for a set of new pumps and other machinery to take the place of the machinery now in use. General improvements will be made to the works.——Napoleon, Ohio; The people will vote on the question of water-works July 30.——Harriman, Tenn.: The East Tennessee Land Co. desires to correspond with parties.——Cloverport, Ky.: A charter has been granted for works here.——Dothen, Ala.: The issuance of bonds for works will be voted on.——Salt Lake City, Utah: The Council has voted to issue $50,000 of water bonds to extend the supply to the North Bench and Capitol Hill.——Springfield, Ill.: A new 30-inch main from the river to the reservoir is projected.——Forth Worth, Tex.: Plans and specifications for the proposed new city works have been completed by the American Water-Works Co. The city has authority to issue bonds.——Santa Barbara, Cal.: The stockholders have just voted to issue $150,000 of bonds to be spent for improvements at the discretion of the directors.——Tacoma, Wash.: Steps have been taken toward bonding the city for $1,500,000 for the purchase of the present works of the Tacoma Light & Water Co., or the building of a new system.——Spokane Falls, Wash.: Investigations for a new water supply are being made by City Engineer Oscar Huber and Capt. T. W. Symonds, Portland, Ore.——Palestine, Tex.: New boilers, a 1,250,000 gal. pump and an 18x150 ft. stand-pipe will be added by the Palestine Water Co.——Livingston, Mont.: The Livingston Water Power Co. has been incorporated by J. C. Vilas, G. T. Chambers and others; capital $250,000.——Hot Springs, S. D.: A $30,000 works is projected, with a supply from a spring of an adjacent hill.——Duluth, Minn.: A special election will be held Aug. 4 to vote on the issuance of $800,000 of bonds for the purchase of the present or the construction of new works.——West Union, Ia.: The village has voted to build works estimated to cost $16,500. There will probably be a stand pipe and 2¼ miles of mains.——Winthrop, Minn.: P. P. Quist informs us that bonds for works have been voted. Supply, deep well, pumping and stand-pipe.——Paullina, Ia.: We are informed that the people have voted in favor of works, but bonds have not yet been voted or other steps taken.——Staples, Minn.: A small fire protection system may be built, with pumping from the Northern Pacific Ry. Co.'s well. Estimated cost, $6,000; bonds not yet voted.——Mapleton, Ia.: We are informed that a vote will soon be taken on building works. It is proposed to pump from wells to a tank.

BIDS AND CONTRACTS.

Noblesville, Ind.: Bids for water works are asked until July 22.——Brookfield, Ind.: Bids will be received until July 23 for water works complete, including a 1,000,000 gallon compound duplex pump, a reservoir, and about 425 tons of pipe. W. E. Schoonover is Clerk of Trustees.——Flanagan, Ill.: Bids for complete water works will be received by the Village Trustees until July 21. E. Litchsfield is president and H. F. Mette Village Clerk.——St. Louis, Mo.: Bids will be received July 21 by the Board of Public Improvements for 640 tons 6 and 12-inch cast-iron pipe, 15 tons specials, 19 6, 12 and 15-inch stop valves and laying 11,500 feet of 12-inch pipe. E. S. Foster is Secretary.——Port Huron, Mich.: Sealed proposals for the construction of a 20-inch cast-iron pipe across and under Black River, will be received until noon, July 27, at the office of the Board of Water Commissioners. Address John G. O'Neill, President.——Louisville, Ky.; Sealed proposals are wanted at the office of the Supervising Architect in Washington, until July 30, for the heating and ventilating apparatus for the U. S. Court House and Post Office.——St. Louis, Mo.: Proposals are wanted until July 21, for the construction of certain sewers at this place. Address George Burnet, President Board of Public Improvements. Proposals are wanted until July 21, for the furnishing, etc., about 640 tons of 16-inch and 12-inch cast-iron coated water pipes; about 15 tons of cast-iron coated special castings; about 19 6-inch 12-inch and 15-inch valves; also for making excavations and hauling and laying complete, in accordance with specifications, about 11,500 linear feet of 12-inch water pipe; 100 linear feet of 6-inch water pipe; setting complete, eight fire plugs; furnishing 300 pounds of wrought-iron straps, bands and bolts. Address George Burnet, President Board of Public Improvements, as above.——Springfield, Mo.: Proposals are wanted, no date stated, for the construction of a sewerage system. Address G. W. Hackney, City Clerk, as above.——Quincy, Ill.: Proposals are wanted until July 30, for public lighting for a term of one year from August 27, 1891 Address Charles H. Gillespie, of the Committee on Light, as above.

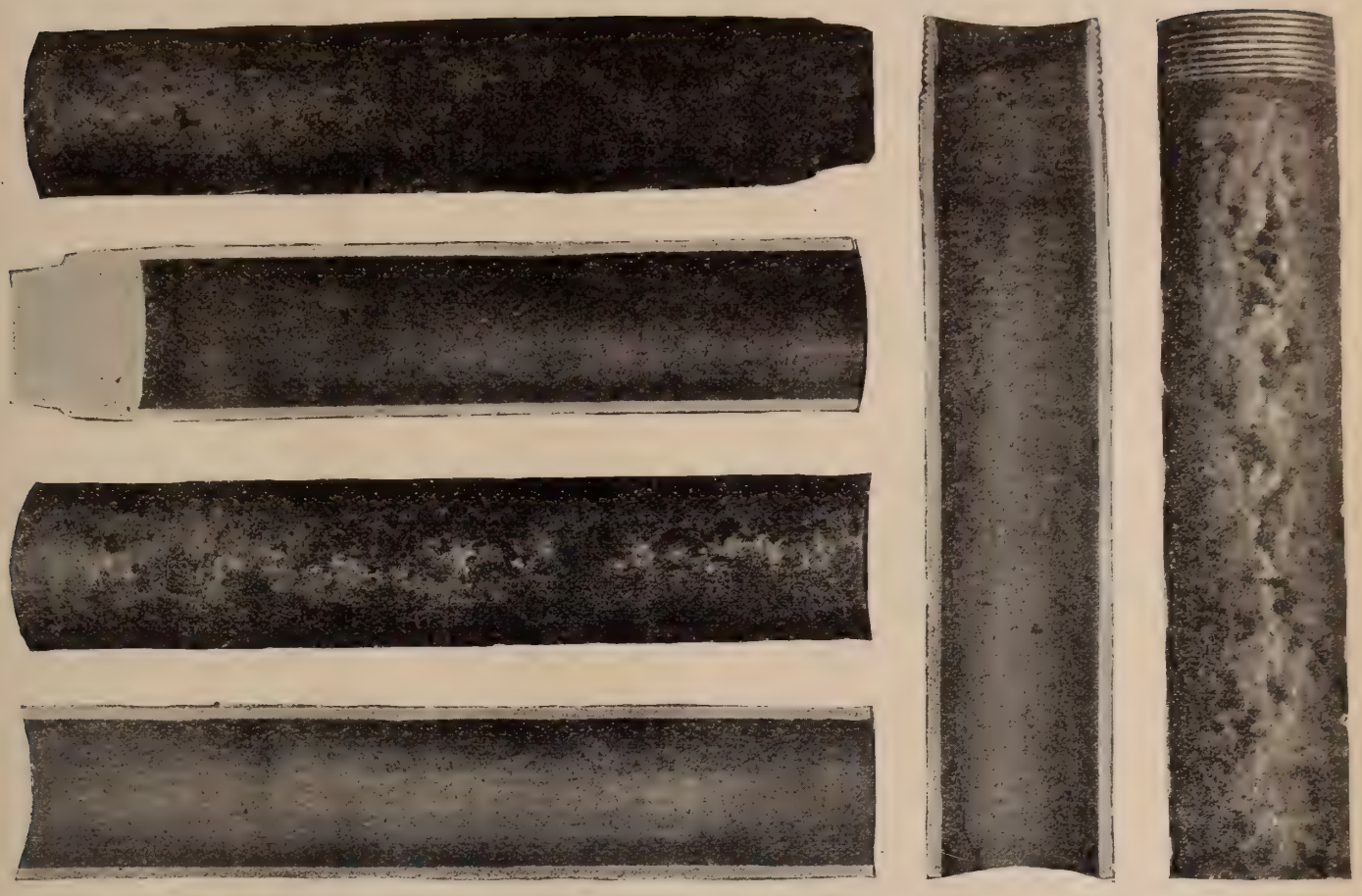
$6.00 to Cincinnati and return. The Big Four Route, C. C. C. & St. L. Ry., will sell Excursion Tickets good going on trains leaving Chicago 9:15 A. M. and 8:15 P. M., Saturday, July 18th, and good returning until Tuesday, July 21st, inclusive. City Ticket Office; 234 Clark Street. Depots foot of Lake, Twenty-second and Thirty-ninth streets. J. C. Tucker, General Northern Passenger Agent, 234 Clark Street. Oscar G. Murray, Traffic Manager. D. B. Martin, General Passenger and Ticket Agent, Cincinnati, Ohio.

OPPORTUNITY.

Master of human destinies am I.
Fame, love and fortune on my footsteps wait.
Cities and fields I walk. I penetrate
Deserts and seas remote. And passing by
Hovel and mart and palace, soon or late
I knock unbidden once at every gate.
If sleeping wake; If feasting rise before
I turn away; it is the hour of fate.
And those who follow me reach every state
Mortals desire, and conquer every foe
Save death; but those who doubt or hesitate.
Condemned to failure, penury and woe,
Seek me in vain, and uselessly implore;
I answer not, and I return no more.

* * * *

But fail not in this respect:
Sieze every opportunity to travel
Over the Chicago, Milwaukee & St. Paul Railway.



THE DURABILITY OF DROP TUBES.

The leading feature of the BOLTON HOT WATER HEATER, manufactured by the Detroit Heating and Lighting Company, Detroit, Mich., is the drop tube through which the circulation is maintained.

These tubes, as many of our readers know, are the same kind as have long been used by the Silsby Mfg. Co., of Seneca Falls, N. Y., in their celebrated steam fire engines.

The tube is secured into the upper part of the heater, and its lower end is stopped by a plug welded in. Inside of the drop tube is a secondary tube, beveled at the lower end and also perforated near the end. This is depended upon to promote the circulation by the relatively colder water dropping down the inner tube and then, in turn, rising in the space between the two tubes. By this construction water is presented against the fire surface of the drop tube in a comparatively thin sheet, thus quickly taking up the heat and promoting rapid circulation.

The point is also made that the constant current of water in each tube prevents any settling of sediment and renders it impossible to burn out at the end as the bottom of an ordinary kettle. In the fierce competition that prevails in the heating trade at the present time the claim made for the durability of these tubes and their freedom from sediment has been attacked. In order to demonstrate that they are absolutely free from sediment and have a life far beyond that which is accredited to them by competitors, the Detroit Heating and Lighting Company have procured some time since from the Silsby Mfg. Company, a tube which had been taken from one of their steam fire engine boilers, where it had been in use since 1875. In the use to which the engine had been subjected, it is fair to suppose that the tube had a greater strain put upon it and been subjected to severer tests than would be encountered in hot water heating practice. This tube was sent by the Silsby Mfg. Company to the Detroit Heating and Lighting Company in the shape in which it was found in the boiler. The latter company cut the tube into three pieces crosswise and also split it longitudinally, in order to show the condition of the tube in all its parts, and likewise to have it in convenient shape for preservation and exhibition. These parts have been mounted and were placed in a neat frame on exhibition at the recent convention of the Master Steam Fitters, Philadelphia. Previous to that they had been shown in their office at Detroit, where they now are. The company also have a direct process engraving made showing a fac similie of the board with the pipes mounted in place. These illustrations have been widely distributed in the trade by means of a handsomely printed circular, the cut which we show herewith being a portion of the engraving referred to. We have taken out the background and present the representation of the sections of the pipe free from the board, because our process of printing renders this plan expedient for showing the features of the tube independent of the background, which is very nearly the same color as some parts of the pipes. By examination of what we present it will be seen that while the pipe is coated to a greater or less extent on the outside, showing evidence of wear and use, the inside of each of the three sections is as clean as the day when it was put into the boiler. This explanation would seem to be a conclusive proof that the life of a drop tube, under the conditions in which it is used in the heater mentioned, is far beyond that which has heretofore been conceded.

The circular above mentioned, as well as the handsome illustrated book, "Warmth for Winter Homes," descriptive of the BOLTON, may be obtained of the Detroit Heating and Lighting Company upon application to the home office at Detroit, or any of its branches, New York, Chicago, Boston, St. Louis and New Orleans.

Durham . System . of . House . Drainage.

Silver Medal Awarded in 1883 to the Durham House Drainage Company, of Chicago.

E. BAGGOT, Chicago.

OFFICE & SALESROOMS: 169 & 171 Adams Street,
BRANCH: 2134 Michigan Avenue, - - -
FACTORY: 367 & 369 Illinois Street, - -

P. V. Dwyer & Bro., St. Paul.

Durham Sanitary Engineering and Construction Co., Minneapolis, Minn.

Hussey & Day Co., Omaha, Neb.
Henry Paul, Houghton, Mich.
J. D. Madden, Fort Wayne, Ind.
J. M. Toye, Winona, Minn.

Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A–C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B–K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C–D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E–F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G–H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

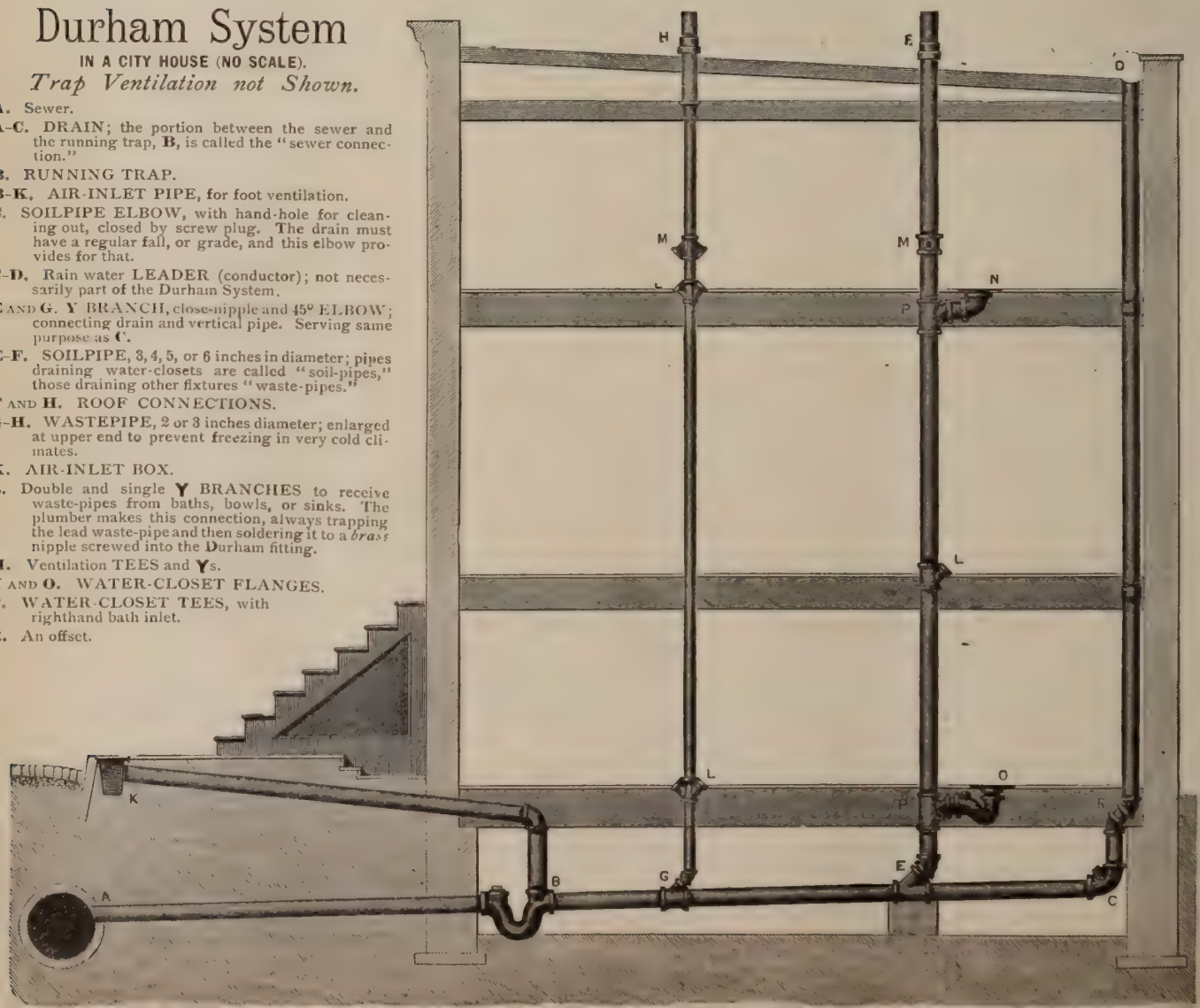
L. Double and single **Y** BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and **Y**s.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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SOME day some man will be found at work on an invention to disposal of dust in cities.

AT the present rate of pollution of our streams by sewage, it will not be long before there will be found a pressing necessity for some other disposal. Work in this direction so far has not wholly been a success. In some localities efficient means have been employed, but a system that will operate successfully in all places and under all conditions is still waiting the inventor's triumph.

GARBAGE disposal is a question always open for discussion. Another question closely connected with this is the matter of making less garbage. Quantities of the garbage that is carted off in different ways should never have left the house. If garbage were reduced to its minimum according to the possibilities of the household, that placed in receptacles for the scavenger would be considerably reduced.

WHEN plumbing work is suspected to be out of repair, it is not safe to neglect it. A good plumber should be called in at once and allowed to make a thorough inspection. It will not cost much and may save a much greater expense later on. A very small defect will in time produce great damage.

NO plumber need to do work for fun. There is not much fun in it. Watch your reputation and your pocketbook and you will come out all right. There are many other things at which you can have all the fun you want. Make plumbing a business.

A ST. PAUL physician is said to have vaccinated two hundred persons with muscilage by mistake. Now, a plumber is not quite that bad. He might make a joint with putty, but he would not do it by mistake.

ONE thing plumbers should remember and that is, in placing a price on work they will never get more than they ask.

THE extension of local associations should not be forgotten or neglected. The strength of the National Association is made up of the local associations, and the greater the number of local associations, the greater the strength of the National Association.

THERE will be no more interesting exhibition at the World's Fair than that which can be made by the manufacturers of sanitary appliances. The many useful and meritorious devices now in use would, when brought together, astonish the members of the trade themselves, and set the owners of homes to thinking in the right direction. Men who are living now without regard to the healthfulness of their homes would look at the matter in a more serious way, and the result would be a more extensive use of modern sanitary appliances.

THE EFFECTS OF SEWER AIR.

Elsewhere in this issue we publish extracts from an address by Dr. Duncan on "Sanitary Aspects of the Plumbing Trade." In this address Dr. Duncan presents the effect of sewer air on the plumber, and draws his conclusions from facts thus limited to a class. The matter cannot be viewed with reference to plumbers in such a manner as to present the effect of these gases on the general public or a household. It is well known that plumbers do not suffer all the evil effects supposed to be produced by the contaminated air of sewers, but the reasons for this have been repeatedly given. The laborers in the Paris sewers are frequently presented as examples of exceptions to the general rule, and their comparative freedom from the disorders produced by the foul gases of sewers has been extensively commented upon. The reasons given do not in any way prove that sewer air is free from any of the evils that have been attributed to it. In the different conditions of the classes may be found sufficient data on which Dr. Duncan could reasonably base his arguments, and while true as to a certain class under certain conditions, they are not true as to other classes under other conditions. The effect of poisonous air or gasses on individuals at rest or in comparative quiet is quite different to the effect of the same agencies on individuals engaged in the exercises and activities of labor. The plumber at work is very different from the family at rest, and, for a great portion of

the time, in slumber. The one cannot be taken as the other, and the fact that the plumber largely escapes the evils of poisonous gases does not prove that such gases do not exist. On the contrary it evidences the fact which has been long known that physical exercise is in a sense an antidote for many contaminations to which an individual at rest would soon succumb. The condition of the one assists nature in throwing off the poisons, that of the other retains them in the system. This is a plain statement of a rule that has long been recognized.

It is well known among sportsmen who go in quest of game in swamps and marshes filled with misasmatic poison, that at the end of a day's hunt, or after a chase of many days, their vigor is uninjured, but that one night's repose in the midst of these marshes fills them with pains, aches and often nausea. Men can work in gases and contaminated air day after day without experiencing ill results, but should they remain quiet in the same place a short time, their systems would become saturated with poison. Men will labor in trenches without any apparent ill effects where escaping gas will soon sicken an idle bystander. For these reasons conclusions drawn from cases of men engaged at active work regarding the nature of sewer gases, are not reliable when applied to the conditions of the household.

In further commenting on sewer gas Dr. Duncan remarks:

"There is no gas in a sewer that you may not find outside of it. The air of a sewer, when it is properly ventilated, is much better from the chemical point of view than the air of crowded churches and schools, or even than the air of the houses in which one-half of the population of Glasgow lives. To many of these people it would be a great advantage to be permitted to live in an average sewer atmosphere rather than in the air of their own houses. In view of the connection between micro-organisms and the spread of infectious diseases, it is important to note that Professor Carnelly and Dr. Haldane found by experiment that the micro-organisms in sewer air are not generally derived from the sewage matter, but are carried in from the outside air, and that many of them adhere to the moist surfaces of the sewer. 'Hence,' they say, 'air in its passage along a sewer will tend to deposit its micro-organisms.' And they prove that the number of micro-organisms in sewer air is actually less than the number in the outside air. Other observers have demonstrated that liquids and damp surfaces do not give off micro-organisms to the surrounding air, and that even when they dry on a surface it is difficult to detach them. The conclusion of the whole matter, therefore, is that it is scarcely possible that the germs of such diseases as typhoid fever, diphtheria, or phthisis can be carried back into our houses through moist drains and soil pipes, and this conclusion is quite in accordance with the opinions I have expressed on various occasions, as the result of careful observation of the spread of such diseases."

The indefiniteness and contradiction of the above statement are fatal to it as an argument. In the first place the doctor asserts that there "is no gas in a sewer that you may not find outside of it." This may be true as to the kind of gases, but as to their nature it is incorrect. The gases emanating from sewage in sewers are more concentrated and virulent than the same gases outside of sewers, and their effect on the human system is entirely different. In the next place it is stated that "the air of a sewer, when properly ventilated, is much better from a chemical point of view than the air of crowded churches," etc. This, if it proves anything, proves that the poisons of sewer gas can be diluted by atmospheric air until they are fairly harmless, and it indirectly substantiates the fact that sewer air undiluted is injurious. It is stated that there are more germs in the atmosphere than there are in sewers. This may be true and yet prove nothing. Everyone knows that the air is swarming with micro-organisms, but they are harmless, while the germs in sewers being pathogenic have the power of producing disease. Again, if, as above stated, the air carries these micro-organisms into the sewer, then this is an argument against sewer ventilation which contradicts the doctor's statement regarding ventilated sewers. The claim that ventilation renders sewer air endurable is contradictory to the claim that the germs in sewers are "carried in from the outside air." The statement regarding the number of micro-organisms without distinguishing the pathogenic from the non-pathogenic is too indefinite to form the slightest basis for any conclusions.

The nature of sewer gas can be seen from an analysis made by the sewer department of Paris of the gas which rises to the surface from the sewer beds in the bottom of the Seine, which is probably similar to that which could be obtained at any sewer outlet. In parts of 100 the gas was found to consist of: carbureted hydrogen, 72.88; sulphureted hydrogen, 6.70; carbonic acid, 12.30; carbonic oxide, 2.54; other substances, 5.68. The rate of liberation of gases in stagnant sewage is one and a half cubic inches per gallon per hour. These gases as chemically produced differ widely in their effects on the human system from the sewer gases. Carbureted hydrogen can be breathed in great quantities without injury. Sulphureted hydrogen will produce vomiting and vertigo, but it is otherwise harmless. Carbonic acid will kill if breathed in great quantities for a sufficient length of time, but if it does not kill, it leaves no after effects. Carbonic oxide either kills or does no harm. So it is with sulphide of ammonia, marsh gas, ammonia, nitrogen and others found in sewage. None of these or combination of them has produced typhoid, dysentery, diphtheria, scarlatina, tuberculosis, but all of these and similar diseases have been traced to sewer gas as their origin. Another observation is worthy of note and that is sewer emanations never enter the household in quantities to poison with carbonic acid or sulphide of amonia or materially to lessen the amount of atmospheric oxygen, yet to these sewer gases have been traced the most deadly diseases and fatal epidemics. The effects of sewer air on the system is wholly unlike that of any gases known. Another thing is worthy of note: The effects of any chemically-known poison are always the same. The effects of sewer emanations differ widely, and when once the poison enters the human system it is capable of reproducing itself without limit, and does so through whole communities.

The microscope reveals numberless living bacteria in sewers, and it finds these same bacteria in those afflicted with diseases traceable to defective drainage. These germs need but some avenue through which to reach the individual to produce disease. It is a mistaken idea that all germs float in the atmosphere in a dried state as particles of dust. Typhoid bacilli are found in the watery vapor that rises from the sewer up through the drainage of buildings. These germs have been isolated and cultivated, and in this vapor, charged with putrefied animal matter, these germs grow and the length of their life is yet undetermined.

It is true that we can find the same gases outside of a sewer that we find in it, but we do not find the same effects produced by them. The effects of any of these gases on a person stop with the individual, but the effects of sewer gas are transmitted from one person to another; and from a single case of disease thus produced wide spread epidemics have resulted. It is also true that we find more germs in the air outside of sewers than we do in them, but they are of a very different nature. The one is harmless, the other is deadly. It is not safe to presume the harmlessness of sewer air. It is wiser and better to consider it capable of the evils it has been known to produce. It is harmless only when kept in the sewer and away from living beings. It should be guarded against by the best system of drainage that can be devised, and a vigilence that will keep the household secure from the dangerous diseases that lurk in its presence.

NOTES AND NEWS.

Berlin gives the carriages of physicians the right of way through the crowded streets. The coachmen wear a distinctive white hat.

Dr. Russell, Senior Pathologist of the Edinburgh Royal Infirmary, has at length secured a cancer parasite and traced its life history. He finds it to be a fungus of the yeast type. Dr. Russell says the discovery can not be definitely accepted until tested by others.

Bacon said: "To be free-minded and cheerfully disposed at hours of meate and of sleepe and of exercise, is the best precept of long lasting."

In Boston the public bathing-houses were extensively patronized during last year, the figures showing the number of bathers to have been nearly a million. This gives about two baths to every Bostonian during the year.

Dr. Griffin, Brantford, Ont., medical health officer, estimates that there have been two hundred cases of measles there during the past two months. Overcrowding in the schools is given as the

cause. Typhoid fever also has been very prevalent in Brantford, from eighty to a hundred cases occuring every year. Bad water from river pollution is doubtless the cause.

A Vegeterian Society has been organized in New York with good prospects of a large membership.

The Phrenological Journal says: One may be a blacksmith, a plasterer, a painter, a whitewasher, a tanner and currier, a stable boy even, and yet be clean. He can do dirty work, and himself, with reasonable effort, not be dirty. But, if one takes filthy substances into one's mouth or stomach, such as whiskey and tobacco, one will emit a very disagreeable stench, which neither cloves, cologne, or other substances can counteract—be *unclean.*

A Russian investigator has preserved tuberculous sputum on pieces of linen at the ordinary temperature of a living room and found that, under these conditions, the infectiveness of the tubercle bacillus was retained two months and a half, whether it was kept in darkness or in the light. His results are confirmatory of all preceding work in showing that this bacillus is very tenacious of life.

The largest apartment house in the world is located in a suburb of Vienna. It contains between 1,200 and 1,500 persons, divided into upward of 400 suits of from four to six rooms each. They are now occupied by over 2,000 people.

The friends of the typhoid fever patient will not fail to remember and be grateful to the physician for his care and skill in treating the patient, says the *Builder*, but would have thought him intrusive and troublesome had he taken one-half the same trouble to see that the cause of the fever was prevented.

An outbreak of typhoid fever, somewhat curious in its origin, occurred in one of the English sanitary districts. The excreta from two cases of typhoid fever had been thrown into an ashpit. Subsequently, some decayed fruit was thrown upon the same ashpit. This fruit was discovered by some children, who were all associated as playmates, and distributed and eaten by all of them. In due time seventeen cases of typhoid appeared among the children whose ages ranged from three to fourteen years.

Dr. Klein, the eminent English bacteriologist, in the nineteenth annual report of the Local Government Board, takes occasion to emphasize a fact which is of great practical importance and should always be borne in mind by health officers, to-wit: The contagion of diphtheria is to be classed with those which can exist and thrive outside the human body; that a room may retain active the diphtheritic contagion for a long period; and that milk may be not only the vehicle, but even the multiplying ground of the diphtheritic contagion.

The new process of treating sewage with a salt of iron, mentioned in the British Architect, seems well adapted for small and isolated areas. It consists simply in treating the sewage with a salt of iron supplied regularly in a certain fixed proportion; the effect is not merely to do away with all offensive odor, but to actually destroy all the noxious elements of the sewage, reducing it to a fine black ash; and producing a perfectly clear effluent. The iron is supplied by means of a ferro-meter. This consists practically of a glass receiver, holding 30 pounds of the specially prepared chemical, enough to last a household of fifteen persons for a week. The lower end of this receiver is perforated by a series of holes, and dips into an earthenware vessel, through which runs a constant flow of water, which gradually dissolves the chemicals, after which it is allowed to pass into the drainage system of the building. By raising or lowering the receiver in this bowl, according to a fixed scale, the rate at which the contents are dissolved may be regulated to suit the size of the household, and the flow of water is capable of similar regulation, a drop per second usually sufficing for a small household, the cost per head per year not exceeding ten pence.

A KANSAS CITY PILGRIM IN CHICAGO.

(By DENT YATES, Sanitary Pilgrim.)

Yes, I had been in Chicago ten years ago, but the Chicago then and the Chicago now are different. The same indomitable energy that made the lake city the pride of the northwest is making Chicago the future metropolis of the United States, if not of the earth. No, I have no Chicago real estate to sell. I am simply convinced by the amazing amount of building in progress and her constantly increasing resources that there is a still greater future for her. The World's Fair will do much for the city, and if she doesn't raise real estate clear out of sight there will be no disastrous reaction. Go through some of the principal streets and see the modern towers of Babel rising all around, and gape with wonder like I did. But this is no *Times* Leader, and I will get down to trade subjects. Why did I not attend the convention? There are two reasons: One was I was not appointed a delegate. True I was an alternate, but mine is a proud, haughty spirit, and if I can't get sponge cake, pie is no compromise. Another reason was that I had an invention which every person or party that had used or seen it said it was a dandy; so I hied me to Chicago. Everybody almost in our line had gone to the convention. I had the pleasure of seeing good Hugh Watt, one of the pioneers of our craft in the West, a man who perhaps has had the privilege of turning out more plumbers who have since become bosses than any other man in Chicago. Hugh has been having very bad health, but is recovering his health again.

Our old friend and master plumber, John Beesley of Kansas City, has been having a peculiar and adventurous career since he left our town. First of all he went to work as journeyman for Ed. Baggot. He was accepted in the Journeymen's Union as a member and all went merry as a marriage bell; but suddenly a dark cloud come over the sky of his happiness. Some fellow made a loud roar and said John had not carried the bag of tools seven years, and had not bright spangles of solder scattered all over his vest. Then a committee approached our friend and wanted him to go and make some fancy plays with the cloth and ladle. To this our friend very properly objected, whereupon the local grand Bashaw snorted, set his ears back and condemned our friend to either take a wash-tub full of solder and a large dipper and wipe a joint around an iron column or be excommunicated. Forthwith John made his escape from the union and brought suit against the union for re-instatement or his initiation fee, and went into business for himself as a master plumber. It may be that I have colored the facts somewhat about John and the local boys, but the fellow who told me the story wore blue glasses. Anyhow John has got a good position on the water supply part of the World's Fair and is doing well.

Our friend D. M. Quay, of Kansas City, has connected himself with a large Boston concern, and is ordering lavatories 300 and more at a time. He is on the Monadnock building at present. It is a sky scraper and a grand structure in every way. There is a year's work for Quay on this building alone.

I had the pleasure of meeting Mr. W. S. McHarg, the eminent hydraulic and sanitary engineer. I had known the gentleman by reputation before, as he had drawn the specifications for some drainage and plumbing work in our city. Mr. McHarg is forging rapidly ahead, and while he has a national reputation and makes specifications and is engineer for nearly every important system of sanitary construction in Chicago, and is engineer of water supply and sewerage of the World's Fair, all of which make him an exceedingly busy man, yet he is a very quiet, unassuming gentleman, and courteous withal.

I stopped in and saw Ed. Baggot at the sign of the Twa-Dogs. Mr. Baggot is a great big man in every sense of the word. Think of a plumbing and gas fixture establishment occupying eight floors of a fireproof building, a passenger elevator to carry you from top to bottom and a freight elevator to carry stock, etc., pipe machines and polishing wheels for gas fixture work, all run by a steam plant belonging to the same plumber! Mr. Baggot has a show room of plumbing specialties as large as any manufacturer in Chicago. Not only this, but he is putting in a large plant to light by electricity. He takes the position that the time of gas fixtures exclusively is short and that the retailers had better stand from under. He practices what he preaches for he is arranging all his gas fixtures so he can make combinations of them almost immediately. Besides this large plant Mr. Baggot & Son have a large establishment, and Baggot also runs a machine shop and foundry where he makes Durham drainage fittings. At present the Baggots, father and son, employ over 300 hands. While I was standing in his office a man came in and gave Baggot's foreman an order to go up to his house and put in a bath tub, water closet and two wash stands and some other work. Did Baggot get

excited? Not he. It did not seem to affect him in the least. Now, in our town, in some of the shops, an order of that kind would cause the boss plumber to strut all around the shop, put his thumb in his vest, hang out the sign, "This is my busy day," and want figures from every wholesale house in the land.

Willie Webster has separated from Rundle, Spence & Co., and is in the jobbing plumbing supply business. He has a partner also; they are both good boys and ought to do well.

I met P. Nacey at his big store on Wabash avenue. Nacey is doing a great business and is making money. He has a nice shop on Wabash avenue with lots of sanitary display. Nacey is doing work all over the town. One of his big jobs is the huge dry goods and general store, the Fair. When this store is completed it will be the largest on earth. The Bon Marche in Paris is the largest at present. Nacey, like Baggot, owes a great deal of his success to surrounding himself with able lieutenants. Baggot has his Charley Hulbert; Nacey has a treasure in his foreman Murphy. Murphy is carrying on all the plumbing and fitting of the Fair job in such a successful way that Nacey doesn't have to worry about the job whatever, and Murphy looks after a great deal of his other work besides. There is only a few of them left. It does not only take a good workman, but a great diplomat, to get on without friction with the journeymen and bosses in Chicago. They have lots of work and are both saucy.

The Geo. A. Fuller Company seem to have the bulk of the large buildings in the general contracting line. They are splendid folks and hustlers from away back.

Well, I think I have told you enough of my impression of Chicago. In my next I will have something to say of St. Louis.

TRAPPING AND VENTING.

Detroit, Mich., July 14, 1891.—Editor The Sanitary News: Having noticed in the News of July 4th, a partial reprint of Leonard D. Hosford's article in *Architecture and Building*, and more especially that portion relating to the use, or rather abuse, of the reventing system as now practiced, we are pleased to find a plumber of Mr. Hosford's standing and experience advocating a reform which has long been needed.

There is to-day no doubt among thinking and progressive plumbers that the present system of indiscriminate and compulsory reventing, regardless of the merits of the trap used, is open to serious criticism; for, as Mr. Hosford asks, "why should a man be compelled, by an arbitrary ordinance, to pay $200 for his plumbing when, by the judicious use of modern sanitary appliances, he can accomplish the same result for $100?"

The fact that the "S" trap would siphon in plumbing practice, was known years ago, when hardly any other style of trap was used, but as evidence that the plumber and sanitarian have not been idle, there are now several devices on the market which to a greater or less extent accomplish the desired sanitary result, without the use of the reventing system, which is at best a complicated, and, in the hands of an in experienced workman, we may say dangerous thing, creating as it often does a false impression of security; as it is now a generally accepted fact, taught by experience, that a vented trap is not always reliable, and will, under certain conditions, lose its seal through siphonic action, when, the fact of its being vented, notwithstanding, it will not always exclude sewer gas.

Mr. Hosford's suggestion that the Board of Health examine the various appliances submitted, determine their fitness for the purpose claimed, and if found satisfactory, issue a certificate of approval with permission to be used wherever practicable, is a good one; and once let this idea prevail and it will not be long before the trap or other device best suited for the most purposes will take its proper place, and it will be possible for the man of moderate means to enjoy the same sanitary advantages as the man of wealth.

Hoping that the plumbers throughout the country will recognize the advanced and valuable ideas of Mr. Hosford and profit thereby, we remain,

Very truly yours,
Detroit Sanitary Supply Co.,
by C. H. Muckenhirn, Manager.

SANITARY ASPECT OF THE PLUMBER'S WORK.

In connection with the District Council for Glasgow and the West of Scotland of the National Registration of Plumbers, Dr. Duncan delivered a lecture on the above subject, which was summed up, after a lengthy discourse, as follows:

The conclusions to which these point are—1st, Plumbers are not more liable than other persons to the class of zymotic diseases usually supposed to arise from sewerage emanations; 2d, although they do not suffer from typhoid fever or diptheria, they do suffer from minor ailments, such as sickness, vomiting, diarrhœa and sore throat, in consequence of exposure to offensive emanations from choked drains and soil pipes; 3d, that plumbers in Glasgow, like their brethren in other parts of Great Britain, have an abnormally high rate of mortality, and are a short-lived race. Under these circumstances the question immediately arises: Is this a necessary result of the occupation, or is it the result of preventable causes? After careful consideration of all the facts, I am quite satisfied that the poisonous material with which the plumber works contributes very greatly to this exceptional mortality. The plumber breathes the poisonous vapor of lead while making and melting his solder; he handles old pipes and pieces of lead covered with the poisonous white oxide. The dust of white oxide gets into his mouth and nose, covers his hands and gets under his finger nails. Lastly, he frequently uses the still more poisonous red lead oxide, with which his hands are smeared, and partaking of his frugal dinner regardless of the red particles smeared on his fingers, he has a daily dose of this virulent lead poison with his daily meal. The effects of this are seen in the organic degenerations which occur in middle life, affecting the brain, the heart and the kidneys. The plumber seldom dies directly of lead poisoning, but he dies from the continual absorption and accumulation of minute quantities of lead in the organs of his body. In this way the organs I have named are gradually impaired in their action and deteriorated in their structure. As in alcoholic excess, so in lead poisoning, it is not the exceptional outburst in violent or painful symptoms which does most damage to the plumber, but the gradual, imperceptible soaking of his tissues with the poison. This makes the danger, and accounts largely for the rapid rise in the mortality of plumbers in the middle period of life. I have no hesitation in saying that this cause of death can be averted by simple precautions. Careful washing of the hands and scrubbing of the nails with a nail brush before every meal, and washing out the mouth with water to remove any particles which may have been breathed through that aperture, would minimize the danger from lead compounds. If, in addition the plumber would avoid the fumes of lead from the smelting as far as lead is concerned, he would suffer very little from this danger. Alcoholic excess is a minor cause of single mortality among plumbers. The plumber is subject to two influences which explain the tendency to the alcoholic excess. First, his business leads him to exposure on the roofs of houses, where he is subjected for hours in the winter to inclemencies of the weather. Feeling chilled he has a natural tendency to visit the dram shop as the most immediate means of restoring feeling of warmth and comfort. Again he is exposed to vile odors in chocked pipes and drains, and he flies to alcohol to overcome the nausea, and the occasional tendency to diarrhœa, which are the result of breathing the noxious gases. This habit is easily acquired, and statistics show that it is a habit the plumber should guard against. It is singular that phthisis caused by the tubercle bacillus is the only disease arising from any contagious germ to be found in soil pipe, drain or sewer which the plumber really suffers from. If we were to adopt the reasoning of the sewer-gas sanitarian we could easily prove that (phthisis pulmonalis) consumption must be got in almost every case from a defective closet, soil-pipe or drain. Such defects only require to be carefully looked for, and they will certainly be found. But modern investigation has shown that neither decomposing typhoid excreta, nor decomposing sputum, whether diphtheritic or tubercular, can give rise to any more noxious gas than any other piece of decomposing organic matter. There is, in fact, no gas in a sewer that you may not find outside of it. The air of a sewer, when it is properly ventilated, is much better from the chemical point of view than the air of crowded churches and schools, or even than the air of the houses in which one-half of the population of

Glasgow live. To many of the people it would be a great advantage to be permitted to live in an average sewer atmosphere rather than in the air of their own houses. In view of the connection between the micro-organisms and the spead of infectious diseases, it is important to note that Prof. Carnelly and Dr. Haldane found by experiment that the micro-organisms in sewer air are not generally derived from the sewage matter, but are carried in from the outside air, and that many adhere to the moist surfaces of the sewer. "Hence," they say, "air in its passage along a sewer will tend to deposit its micro-organisms." And they prove that the number of micro-organisms in sewer air is actually less than the number in the outside air. Other observers have demonstrated that liquids and damp surfaces do not give off micro-organisms to the surrounding air, and that even when they dry on a surface it is difficult to detach them. The conclusion of the whole matter, therefore, is that it is scarcely possible that the germs of such diseases as typhoid fever, diphtheria or phthisis can be carried back into our houses through moist drains and soil pipes. and this conclusion is quite in accordance with the opinions I have expressed on various occasions as the result of careful observation of the spread of such diseases. But it does not follow that the breathing of sewerage gases is innocuous. The evidence I have brought forward to-night as to the large percentage of plumbers who suffer from sickness, sore throat and diarrhœa, and the still larger number who die from consumption of the lungs, point in the direction in which to look for the evil effects of sewage gases. By the breathing of an impure atmosphere the lung tissues are manured and prepared for the growth of the tubercle bacillus, which sooner or latter takes advantage of the altered circumstances. In conclusion, Dr. Duncan said that all the plumber needs to raise his position is education and combination. The registration movement with its technical classes and entrance examination, will certainly bring about the needed improvement. With increased knowledge of the dangers to which he is exposed, and of the dangers to which he may expose the public in the careless exercise of his craft, he will not only learn to guard his own health and the public health, but he will also gain the confidence and the esteem of his fellow countrymen.

CONVENIENT TO HAVE ABOUT.

Experiment on the action of different oils on metals shows among others that bronze is much corroded by linseed oil, slightly by olive oil and not at all by colza oil, and that for lead the safest lubricant is olive oil and the worst whale oil.

Two to four per cent. of powdered marsh mallow root, mixed with plaster of Paris, makes it set more slowly, and so greatly increases its hardness when it has set, that it can be sawn, filed, and turned in the lathe. Eight per cent. of powdered root will retard the setting for an hour.—*Invention*, London.

True profit in any business lies in reducing expenses rather than in increasing gross receipts. There are very few manufacturing establishments in which there are not important leaks, the stoppage of which would yield a profit without any other charge being made in the management of the business.—Robert Grimshaw's Hints to Power Users.

Wood and Iron notices an ingenious way of cooling a journal in machinery that cannot be stopped. This is to hang a short endless belt next to the box, and let the lower part of it run in cold water. The turning of the shaft carries the belt slowly round, bringing fresh cold water continually in contact with the heated shaft, and without spilling or spattering a drop of water.

To crystalize tin plate. The figures are more or less beautiful and diversified, according to the degree of heat and relative dilution of the acid. Place the tin plate, slightly heated, over a tub of water, and rub its surfaces with a sponge dipped in a liquor composed of four parts of aquafortis and two of distilled water, holding one part of common salt or sal ammoniac in solution. Whenever the crystalline spangles seem to be thoroughly brought out, the plate must be immersed in water, washed with a feather or a little cotton (taking care not to rub off the film of tin that forms the feathering) forthwith dried with a low heat, and coated with a lacquer varnish, otherwise it loses its luster in the air. If the whole surface is not plunged at once in cold water, but if it be partially cooled by sprinkling water on it, the crystallization will be finely variegated with large and small figures. Similar results will be obtained by blowing cold air through a pipe on the tinned surface, while it is just passing from the fused to the solid state, Here is another recipe: Sulphuric acid, 4 oz.; soft water, 2 to 3 oz., according to strength of the acid; salt, 1¼ oz. Mix. Heat the tin hot over a stove, then with a sponge apply the mixture, then wash off directly with clean water. Dry the tin and varnish with demar varnish.

To mark tools, first cover the articles to be marked with a thin coating of tallow or beeswax, then, with a sharp instrument, write the name in the tallow. Clear with a feather; fill the place written, the letters, with nitric acid; let it remain from one to ten minutes, then dip in water and rub off, and the marks will be etched in the steel or iron.

To restore files and other cutting tools when blunt from use clean thoroughly from grease or oil by using alkali, soda or potash. Then dip in solution made with one part nitric acid, three parts sulphuric acid, seven parts water by weight, five seconds to five minutes, according to fineness of cut. Then wash in hot water, dip in milk of lime; dry and oil.

The best way to clean solder from old files is to soak the file in raw muriatic acid for twenty-four hours, and you will have almost a new file.

For glue to resist heat or moisture: Mix a handful of quicklime in four ounces of linseed oil, boil to a thickness, then spread it on thin plates in the shade, and it will become very hard, but may be easily dissolved over the fire as glue. A glue which will resist the action of water is made by boiling one compound of glue in two quarts of skimmed milk.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The friends of cleanliness, healthfulness and comfort should recognize the important fact that a city is smoky and grimy because it is suffered to be so without any excuse for it. Our streets and walks would be in a state of filth and uncomliness did not some one enforce the ordinances designed to prevent it. Our homes would soon become disorderly and unkempt did we not enforce an observance of cleanliness and order. Our own persons would soon become obnoxious to decency did we neglect the proper care of ourselves. It is the general rule that the tendency of all things is to ruin, disorder and dissolution. It is only by the strict regard of the rules of cleanliness and healthfulness that we are enabled to keep ourselves and surroundings in a condition befitting the common sense of enlightened humanity and civilization. Our atmosphere is no exception to the general rule. The laws adopted to keep it pure and healthful must be enforced. If these be natural laws, they must be permitted to operate by the removal of unnatural obstructions. If they be civil laws, they must be made operative through the courts established to execute them. No one can retire from the contest and say that the laws cannot be enforced. This is a confession of weakness and cowardice that no man would own. All laws can be enforced. The whole civil, moral and military powers of this country are behind every law on our statute books to enforce every law in them. More than this, every citizen in the United States is an officer and can proceed through the proper channels to have the laws enforced and their violation punished. Certain officials are elected or appointed for the performance of certain duties in the enforcement of laws in special departments, but they are but servants of the people, and back of and beyond them are the prerogatives and power of the people who are the makers of all laws and the final counsel, judge and jury. The enactments governing the smoke nuisance stand on a level with other statutes and their enforcement is no more difficult. The same channels are open to them as to others, and the prevention of smoke is to be found through the same agencies. Our laws are reasonable laws. They do not ask men to do impossible things, and it is too late a day now for a man to fall back and presume on the ignorance of the people by saying that smoke cannot be prevented or the nuisance abated.

It is to be expected that smoke producers will oppose prevention. The man who would throw ashes and garbage into the streets is not friendly to the law which compels him not to do it. Every violator of law is an enemy to the law he violates. We

cannot rely on the producers of smoke to prevent it of their own free will. They must be induced or forced to do it, and the way to do this is to take steps direct to the end in view. The fact has been established that smoke can be prevented, and the next step is to prevent it. Science and mechanical ingenuity have solved the first problem, and it but remains for the people to solve the second by the enforcement of laws enacted to that end.

About the weakest and most sily excuse ever made regarding the prevention of smoke is, that neglectful and careless firemen will not attend to the devices for the consumption of smoke and they will not be used, get out of order and become inefficient. If this is a laudable excuse, then there is an excuse for about all the ills that we could be made to suffer. Besides, if this be true, that same carelessness and negligence will destroy the usefulness of boilers and engines, and the men who make these excuses should not use boilers and engines at all. That same carelessness and negligence will soon put a dwelling in such disorder and discomfort that it would not be fit to live in; therefore no one should have dwellings. Furthermore it is as much a man's duty to employ a fireman who will obey the law in the performance of his labors as it is for him to employ a driver who will not willfully run down people in the streets. This excuse is so foolish that it would not be worth an answer were it not so general. The fact is these devices are simple of construction and easy to operate. Ordinary care and intelligence with the industry necessary for the accomplishment of all labor are all that they require. The claim that they are complex and difficult to operate is all nonsense. They are an aid to firemen and an economic factor in the consumption of fuel. Everything favors their use. Their first cost may be a drawback to some, but their use for a short time will repay that and leave a good profit on the investment. These facts should all be taken into account by the tender-hearted who hesitate to discharge their duties for fear of placing a burden on furnace owners; their burden is quite light compared with the burden the people have to bear who must suffer a smoke defiled atmosphere. There is but one side to this question, and that is the one favoring smoke prevention. If there is another possessing argument worth considering favoring smoke production let us hear of it. A proper discussion of the matter will be a benefit in some way. It will bring out the opinions and experiences of those interested and will narrow down the subject to the real difficulties in the way and open up an opportunity to remove them.

* * *

The *Stationary Engineer* publishes the following which speaks for itself and gives evidence of the efficiency of smoke prevention by devices that are obtainable for any locality where wanted:

The smoke preventer invented and patented by Mr. A. J. Cliff, of Chicago, was recently given a thorough test by Mr. Geo. Bradford, engineer of the San Francisco *Examiner*. This test extended over the month, from April 20 to May 20. The results are as follows:

Water evaporated during month	925,687 lb
Coal burned (white ash)	112,090 "
" " per hour	290 "
" " " before Cliff preventer was attaehed	320 to 340 "
Coal saved per hour	30 to 50 "
Water evaporated per lb of coal	8.25 "
" " " " " " before Cliff preventer was attached	5½ to 6 "

This shows a saving not only in the actual amount of coal burned, but also of an increase in evaporative efficiency of at least one-third. With these actual results in view, there seems to be no reason why the device should not find a ready sale.

DEATH OF JOHN J. WEAVER.

It is with sorrow that we make the publication of the death of Mr. John J. Weaver at Philadelphia July 15. His many friends throughout the country will be pained at this intelligence. In his death a prominent figure of his city and state and a valuable member of the National Association of Master Plumbers, has passed away. He has been prominent in many capacities in which the object was to advance industrial prosperity and extend the opportunities of education to young men in industrial trades. In the work of the National Association he has been foremost since its organization, working faithfully for its success. His counsels and advice were always the dictations of wisdom and a noble heart. Wherever known he was respected and honored, and his name will abide tenderly in the memories of all who knew him. The esteem in which a man is held at home is the best evidence of his worth, and as evidence of Mr. Weaver's high place in the affections of those who knew him best, we give the following from an editorial in the Philadelphia *Leader*, his home paper:

John J. Weaver, whose death was announced yesterday, was a public spirited citizen, who for thirty years has devoted his leisure time to promoting educational and other enterprises for the benefit of the city. From the time that he graduated from the Boys' Central High School, in 1860, he was inspired by gratitude for the opportunities for improvement he had been given, and labored zealously in various fields to extend educational advantages to other young men. As a member and at various times one of the managers of the Franklin and the Spring Garden Institutes he was a zealous advocate of schools for young men. He was Chairman of the committee of the Spring Garden Institute that established there, in 1879, the first mechanical handiwork schools in the city, and, we believe, the first manual training schools proper in the country. From these, during Mr. Weaver's active service, were developed the similar schools of Girard College and the City's Manual Training School. Mr. Weaver also helped to establish the Trade School for plumbers, now merged in the Trade Schools of the Builders' Exchange, of which Mr. Weaver was an active organizer and director. These were his chief enterprises, but he was active also in performing the general duties of good citizenship, and always took an active part in political reform movements. His main characteristic was zeal and energy in the prosecution of any undertaking he essayed, and it was this quality that made him a leader in school organizations. He passes away in the prime of life, but with the institutions he helped to start or rejuvenate firmly established and fitted for many years to come to bring honor to his memory.

HONORED AT HOME.

We are pleased to give publication to the following resolutions adopted by the Master Plumbers' Association of Milwaukee:

This is to certify that, on the 7th day of July, 1891, at a regular meeting of the Milwaukee Master Plumbers' Association, the following resolutions were offered and unanimously adopted, to wit:

Resolved, That, whereas, this Association, having been informed that Edward C. Smith, one of the first and foremost merchants, has recently severed his connection with the Rundle-Spence M'f'g. Co., and retired from active business in this city, and that he is about to remove to Chicago, where he contemplates engaging in business and making that city his future home, and whereas the relations between the members of this organization and the retiring dealer having been always of the most cordial and friendly character both in a business and social way, they desire to express their regret at his departure and their esteem for his personal character, be it therefore,

Resolved, That the retirement of Edward C. Smith from business in this city is a subject of sincere regret to all members; that his removal from this city is a loss to its business interests and a gain to the city of Chicago.

Resolved, That in whatever pursuit he may be engaged, we most heartily wish him success, and that our warmest sympathies will always be with him

Resolved, That this Association commends him to our sister organization in the city of Chicago as an upright and honorable companion and to the business at large of that city as an honest, conscientious and careful business man.

Resolved, That a copy of the foregoing preamble and resolutions be transmitted by the Secretary to our retiring friend.

In witness thereof said Master Plumbers' Association has caused this certificate to be signed by its President, and countersigned by its Secretary, at Milwaukee, Wis., this day of July, 1891. Philip H. Murphy, President,

Chas. Polachek, Secretary.

We have a letter asking for a sample copy of The Sanitary News from Dr. Osrda Kotaro, 67 Sanchome, Minamidori, Nishinagahori, Osaka, Japan.

AN OBJECT LESSON AND A COMMENDABLE ONE.

Riley Bros., have just completed the plumbing and drainage of the Garfield Racing Association, placing in position 130 hydrants 50 closets, bath rooms &c., besides the attachments for bar, kitchen, &c. There is nothing particular to be said about this job except that it is a good straight plumbing job, and peculiarly a plumbing job. The closets under the main building in ordinary cases or by ordinary plumbers, would no doubt have been patented cast iron latrines, but like the good plumbers that the Riley Bros. are, the latrines are of home manufacture, lined with lead in the good old fashioned manner, with wiped corners, admirably fitted and adapted to the purpose required, the floors safed with sheet lead, the urinal stalls of sheet lead, the entire outfit thoroughly vented and revented; and, taking it all in all it is a most excellent job for the purposes intended. The peculiarity of the entire work is the absence of ready made goods. It gives a lesson to the trade that may be a valuable one—no intelligent firm looking at the work, but would be convinced that the lead fixtures, adapted as they are to their several purposes, are not only equal but superior to any of the manufactured article for the same purpose now in the market. The entire job is a credit to the energy and perseverance of the Riley Bros,

PLUMBING NOTES.

The health officer of Columbus, Ohio, has recommended to the Board of Health that an inspector of plumbing be appointed, it being his belief that much of the disease in the city is attributed to defective plumbing and sewerage.

In connection with the International Congress of Hygiene and Demography, to be held in London in the month of August, it has been arranged that one afternoon will be set apart for a special meeting of the Congress for the consideration of "the education and registration of plumbers in relation to the public health." It is hoped that the meeting will be presided over by the Right Hon. C. T. Ritchie, M. P., president of the Local Government Board. The meeting will be attended by representatives of local organizations, including the mayors, chairmen of health and sanitary committees and medical officers of health of the chief cities and towns of Great Britain and Ireland. The Court of the Plumbers' Company will undertake the necessary arrangements.

The Dublin District Council for the National Registration of Plumbers have recently acquired suitable and commodious premises in Dublin, including a large and well-lighted workshop admirably adapted for the purpose of holding examinations. The honorable secretary reports that the practical classes which have been carried on for the past three months, twice a week, for the training of plumbers' apprentices have been largely attended. There were between thirty and forty students, some of whom have now come forward for examination. Lectures have been delivered on the principles of plumbing by Mr. W. Kaye Parry, M. A., C. E., architect; Mr. Wm. Baird, master plumber; and Mr. A. Bowie, operative plumber. The attendance at these lectures was very large.

Peter Bonenberger, of Milwaukee, has applied to the circuit court for the dissolution of his partnership with William L. Guager in the plumbing business. The plaintiff claims that the constant bickering between the two renders it impossible for them to conduct the business properly.

Mr. Dent Yates, of Kansas City, dropped in upon us last Monday and this time found us in. He is in Chicago again in the interest of his patent Ice Water Apparatus. The main features of this system are briefly that a large tank is placed in the basement of a building, neat marble drinking fountains are placed on the different floors and the water also is used that comes from the melted ice in the auxiliary cooling coil as well as the waste water from the fountains, the result being the utilization of practically every degree of cooling properties of the ice. By using his patent circulating pipe and packing there can be no dead water in any part of the coils, so the water is equally as cool, or at least within one or two degrees as cool, on the seventh floor (or the fifteenth floor if necessary) as when the water leaves the cooling tank in basement. This is no experiment as it has been demonstrated for the past three summers at the Board of Trade building, Kansas City, where both supply and circulating pipe run up a pipe shaft which is always at 115 Fahr., the severest possible test. The following points make this cooling superior to any other we have seen or heard of: First, cheapness of construction, as it can be put in cheaper than fountains with separate coils on each floor. Second, saving in ice. The Chief Engineer and the President of the Board of Trade building in Kansas City, state that with this apparatus they use one-third less ice than in the usual way. Third, the saving in janitor service. Fourth, the saving in buying ice by the ton instead of the pound. The saving in buying ice by the ton in this city is about twelve dollars per ton, and there is no waste by chipping. The apparatus is applicable to new and old buildings. It will be put in under strict bond with a guarantee to do as claimed before any money is paid. Mr. Yates is preparing to place this system in several buildings in this city. The Fair will be supplied with it, as well as other buildings in other cities. Mr. Yates states that there is nothing wild about this. That it is as represented. He has a good thing and we wish him abundant success. He may be addressed at 20 East Sixth street, Kansas City, Mo.

A note from John McMahon & Co., of St. Louis, states that business in that city is very good with prospects of a large increase for next year, and, we hope the prospects are also favorable for good prices.

We have information from Florence, Ala., that Barton A. Whitsett, plumber, known in this city, is in the insane asylum and pronounced incurable.

A letter from Stewart & Johnson, plumbers at 1217 East Franklin ave., Minneapolis, Minn., winds up with these cheering words: "We like your paper very much and could not be without it now." It gives us great pleasure to learn that we are pleasing the plumbers in our efforts to publish a first-class paper.

At the Cincinnati convention there were some vacancies in state vice-presidents and committees to be filled by President Macdonald of the National Association, He announces the appointment of the following committees: Sanitary Committee—W. A. Kelley, chairman, Cleveland, O.; S. E. Dibble, New Haven, Conn.; R. W. Whigham, Chattanooga, Tenn.; Chas. W. Murray, Cincinnati, O., and Charles Geiger, Buffalo, N. Y. Essay Committee—D. W. Littell, chairman, Plainfield, N. J.; J. J. Wade' Chicago; John J. Weaver, Philadelphia; James Gilroy, N. Y.; D. H. Middlebrook, Bridgeport, Conn.; Apprenticeship Committee—Wm. G. Reid, chairman, Rochester, N. Y.; W. N. Tobin, Syracuse, N. Y.; Thos. H. Radcliffe, Brooklyn, N. Y.

The following disposal of smoke nuisance cases was made the 16th inst. Leo. Austrain & Co., fined $25; Coleman & Larson Co., A. Schultz, Chicago Tie Preserving Co., M. Schultz, were fined each $20; Underwood & Co. and M. Field & Co., were each fined $10; O. F. Meyer and Rees Bros. cases were discontinued on payment of costs.

WHERE PLUMBING WORK IS BEING DONE.

GIVING THE NAME OF PLUMBER AND THE LOCATION WHERE PLUMBING MATERIAL IS WANTED. PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

574 Ashland ave., C. Breyer.
1170 Albany ave., C. Uher.
2024 Armour ave., J. J. Clark.
77 Brighton street, W. J. Mueller.
169 Bunker street, C. Uher.
3139 Butler street, C. Uher.
Berkley ave., north of Forty-fifth street, Wm. Bowden.
4951 Butterfield street, J. B. Sheville.
7730 Bond ave., J. and B. Rourke.
821 Chestnut street, Lyon & Lee.
Chestnut near Halsted street, Lyon & Lee.
Centre ave. and Indiana street, C. Breyer.
Cleaver and Blackhawk streets, C. Breyer.
132 Cleaver street, C. Breyer.
15 Carpenter street, J. D. Mills.
1017 North Clark street, Alles & Bro.
5712 Carpenter street, W. H. Murphy.
342-44 Cortland street, Harvey & Mose.
Division and Samuel streets, J. J. Walsh.
Douglas street in Irving Park, John Doyle.

Dixon street north of Division, F. Falk.
835 David ave., Peter Gow.
218 Englewood ave., Garner & Bahn.
5110 Emerald ave., J. Gannon.
2623 Emerald ave., C. Kostlevy.
6800 Emerald ave., W. H. Murphy.
Eighty-ninth and Wood streets, Wm. Bletch.
2847 Fifth ave., J. Teutch.
641 Forty-second street, A. Miller.
Fifteenth street and Laflin, R. M. Cullogh.
Fifty-seventh and Sherman streets, Wm. Bowden.
3631-35 Forest ave., Wm. Bowden.
29 Fry street, M. Brooks.
Fillmore street near Sacramento ave., S. Smith.
Fifty-fifth street near Lake ave., J. and B. Rourke.
7120 Green street, F. Murphy.
Greenwood ave. north of Centre, J. Doyle.
5621-25 Halsted, Wixted & Gibson.
130 and 109 Hamburg, C. Breyer.
374-76 Huron street, C. Breyer.
Hoffman ave. near Franklin street, Garner & Bahn.
492 Hastings street, J. Walsh.
321 Huron street, W. J. Mueller.
6252 Halsted, L. Clark.
96 Johnson ave., Peter Gow.
865 Kedzie ave., Peter Gow.
5137 Lake ave., J. J. Clark.
5534 Lake ave., J. J. Clark.
1462 Lexington ave., J. McDonald.
11-13 Loomis street, Oliphant & Liddell.
523 Lincoln, W. J. Mueller.
2995 Lyman, C. Uher.
2706 Iowa ave., M. Weber.
Loomis street near Jackson, J. J. Clark.
241 Linden place, Wm. Bletch.
1015 Leavitt, P. Gow.
5500 Lake ave., J. and B. Rourke.
5422 Monroe, L. Clark.
9 Milton street, C. Breyer.
548 Madison, Sims & Son.
6005 Morgan, J. Gannon.
41 Menominee street, R. Powers.
Marshfield ave. near Forty-seventh street, C. Kostlevy.
Morgan street near Austin ave., Watson & Davidson.
5423 Monroe ave., J. & B. Rourke.
89 Norwood, P. Gow.
866 Oakley ave., Harvey & Mose.
389 Orchard street, Val Ruh.
2825 Portland ave., John Teutch.
Peoria street near Fifty-seventh, Wixted & Gibson.
3140 Parnell ave., Nash & Hama.
Paulina street near Taylor, Sims & Son.
Potomac & Davis streets, P. Gow.
Rosenmerkle near Wallace, J. Gannon.
Root near School, G. Feldkamp.
7802 Sangamon, Lyon & Lee.
State and Sixty-first street, Wixted & Gibson.
State and Sixtieth, Wixted & Gibson.
4440-53 School street, A. Miller.
260 Sheffield ave., C. Breyer.
124 Stave street, Garner & Bahn.
620 Sawyer, W. H. Cummins.
Seventy-first and Peoria streets, J. Gannon.
881 Spaulding ave., B. Becker.
Sixty-fifth and Carpenter streets, C. Kostlevy.
Seventeenth street east of Wood, C. Kostlevy.
3946 School street, F. Murphy.
7910-12 Sherman street, W. H. Murphy.
707 Seymour street, Harvey & Mose.
5614 Sangamon street, J. Conraths.
Seventy-ninth and Reynolds streets, Brunt Bros.
820 Thirty-seventh street, Wixted & Gibson.
Twenty-fourth place, Kelleher & Son.
Twenty-eighth near Hanover streets, Kelleher & Son.
Taylor street near Blue Island ave., Sims & Son.
1497 Taylor street, W. H. Cummins.
Taylor street and Marshfield ave., P. Becker.
581 Thirty-second street, C. Uher.
168 Twenty-first, F. Tegtmeyer.
Winter street near Eightieth, C. Kostlevy.
3020 Wentworth ave., J. Teutch.
6822 Wentworth ave., Lyon & Lee.
Whipple and Twenty-seventh streets, Steiner & McFarlane.
Wood & Division streets, J. J. Walsh.
1225 Wilcox ave., W. H. Cummins.
Waller and Seventy-second streets, W. Daniels.
1067 Warren ave., Young & Cavanah.
6256 Wabash ave., C. J. Herbert.
Western ave. south of Jackson street, C. Herbert.
6335-37 Wharton, Wm. Bowden.
1135-37 Wrightwood ave., G. Tipple.
392 Wabansia ave., Harvey & Mose.
4819 Wabash ave., J. B. Neville.
885 and 1015 Washtenaw ave., P. Gow.

THE CHICAGO MASTER PLUMBERS' ASSOCIATION.

An enthusiastic meeting of the Chicago Master Plumbers was held at the Grand Army Hall, Thursday evening. Reports were received from the secretary and president of the delegation to the Cincinnati convention. The reports were interesting as well as entertaining, and will be published in full in our next issue. In this connection, we may state that at no time in the history of the association were the relations between manufacturers and dealers so harmonious as at the present. Every wholesale house in the city is working in harmony with the Baltimore Resolutions and is thoroughly alive to their own interest as regards protection of our trade interests. We bespeak a hearty patronage to our local houses by reason of our present relations.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

New York City, N. Y.: Buchman & Deisler have plans for a 3-story and basement fireproof extension, 40x55, to be built to the Manhattan Hospital, on One-hundred and Thirty-first street, west of Amsterdam avenue, at an estimated cost of $30,000. J. C. Burne has plans under way for P. Sheehy, for alterations to the 4-story building on the northwest corner of Second avenue and Eighty-third street, and for a 5-story tenement house and store, to be built on the north side of Eighty-third street, about 80 feet west of Second avenue, 27x94. The cost together will be $32,000. James T. Berry will build four 5-story flats, 25x72, on the south side of One-hundred and Forty-second street, 100 feet west of Third avenue, at a cost of $64,000. Frederick Ebeling has plans for a 5-story flat and store, 25x40, to be built by Jacobson & Margovitz, at 133 Willett street, at a cost of $14,000. The front will be of buff brick and brownstone. The State Commission in Lunacy held an informal meeting at the Gilsey House on Wednesday. The Board to Establish State Hospital Districts for Insane Persons held a meeting afterward and appropriated $110,000 for the erection of additional buildings on the State Hospital grounds at Poughkeepsie.——Chicago, Ill.: A. Druiding, architect, corner of LaSalle and Randolph streets, Chicago, has the following buildings on hand: St. George Catholic church to be built at Thirty-ninth street and Wentworth avenue. Church to be built of brick with stone trimming front and pressed brick; church to be 146 feet deep and 71 feet wide and two towers, one 160 feet and the other 110 feet high. It will have slate roof and will be heated with hot water. The church to be built in the early gothic style, to have 800 seating capacity: St. George parstor's residence, to be a 2-story brick with stone basement. The building to be slated, and heated with hot water. All modern improvements will be in the building. Cost, $9,000. Catholic school house in Naperville, 2-story basement building, 84x60; all built of Naperville stone. The building will be erected with all modern improvements, with best system of heating and ventilation, to contain 4 large school rooms in first story and hall and ante-room in second story. The basement to contain play rooms and the heating and ventilating apparatus. St. Xavier Church, in LaGrange, to be frame, with the

exception of a stone basement. The basement to contain 3 school rooms, and the church to have a seating capacity of 3,00, to be 48x93.6 and tower to be 94.8 high. St. Stanislaus church, near Douglas Park, to be built of brick with stone for basement; first story will contain church auditorium with 400 seating capacity, second to have two large school rooms and the pastor's residence, 58x76.6. Pastors's residence for St. Teresa's congregation, to be 29x70, consisting of basement and 2-story with a stone front. The building to contain all modern improvements, will be commenced at an early date, to be ready for occupancy about November 1. St. Peter and Paul's Church at Ellinwood, Kansas, to be 46x 80, with a tower 120 feet high; church will be built of local brick with a stone frame work. Henry Sierks has planned a 5-story factory, 114x168, for the Western Wheel Works, to be built on Siegel street, near Wells. Pressed brick and stone construction; cost, $80,000. Patton & Fisher have planned a 4-story basement and attic hotel, 40x85, to be built at the corner of state and Erie streets, by J. L. Oviatt. Stone, pressed brick and hardwood construction, warmed by steam; cost, $20,000. John Addison has designed the Porter Memorial Church, to be built at 500 South Paulina street, by the Union Park Congregational Church. It will be 102x73, and will be constructed of stone, the upper part being of cement and timber; cost, $10,000. He has also designed for Annah B. Peck a 3-story stable, 21x53, to be built at 2446 Michigan avenue; cost, $7,500. Flanders & Zimmermann have planned a 2-story basement and attic residence for Mr. Worcester, to be built at Maumee, Ill.; cost, $5,000. For Mr. Halman they have designed a $5,000 residence, to be built at Buena Park. Park & Fuller have designed a 3-story store and flat building, 50x70, to be built on west Madison street, near Sacramento avenue, by Wm. Smith. They have also planned two 2-story flat buildings, 44x66, to be built on Warren avenue, near Francisco street, by Chas. Giles; cost, $10,000. W. D. Cowles has designed a 3-story store and flat building for E. D. Murray, to be built on Cottage Grove avenue, near Seventy-first street; cost, $12,000. Julius Huber has planned a large waiting room, to be erected at High Ridge, for the Chicago & Northwestern Railroad. The same architect has planned two 2-story residences for B. F. Weber; cost, $6,000. Robert Rae, Jr., has designed a 4-story store and flat building for Frank Smith. It will cost $25,000. William Wilson will also build, after plans by the same architect, a 2-story and basement residence; cost, $10,000. He has also planned two $2,500 houses for Fodner Bros., to be built at Austin. For the Equitable Building and Loan Association, at Beverly Hills, he has planned two 2-story and celler flat buildings; cost, $7,000. For J. P. Mallette he has planned two 2-story and cellar flat buildings of stone and pressed brick; cost, $15,000. For Eggleston, Mallette & Brownell he has planned two 2-story and cellar flat buildings; cost, $15,000. C. S. Corwin has designed a 2-story basement and attic residence for Dr. A. W. Horan, to be built on Greenwood avenue. Stone and pressed brick construction, with basement, with frame above; cost, $15,000. Huehl & Schmid has designed a 3-story and basement flat building to be erected on Frederick street. Pressed brick and brown stone construction; cost $12,000.——Philadelphia, Pa.: The old frame building at the southwest corner of Filbert and Eighth streets have been demolished, and Contractor Harry C. Nichols has commenced work upon a handsome new business house, 15x102, four stories high. John J. Cassidy will build 200 houses in the southern end of the city during the season. The dwellings will be two three stories high, built in rows with roomy stores at each end. Fred J. Amweg has been awarded the contract for the erection of a residence at Roanoke, Va., for E. T. Burnett of the Norfolk and Western Railroad. Architects Moses & King are planning a hotel, to be built in South Jersey. The drawings for a large church, to be built in this city, have been completed by Thomas P. Lonsdale. At Wallingford, Pa., the Knights of Pythias will build a hall. The congregation of the Calvary Presbyterian Church will build a new edifice at Rutledge, Pa. James Johnson of this city has been awarded the contract for the erection of a new banking house for the First National Bank of Woodstown, N. J. Albert W. Dilks prepared the drawings. A committee has been appointed by the Mercantile Social and Literary Club to select a site and build a club house. On the south side of Wyalusing avenue, east of Fifty-fifth street, a 4-story factory building will soon be erected by Henry Brooks. Contractor Phillip Haiback will erect a 4-story building on the south side of New street east of Third. The building will be fitted up for a first-class restaurant, with accommodations for lodgers. At Thirty-eighth street and Powelton avenue an academy, 50x80, and a 3-story dwelling will be built at once by J. W. Hellflich, The plans for extensive alterations to be made to the residence of James N. Dingee, at Paoli, have been completed by Architect T. Roney Williamson. Hon. John B. Robinson will build a hall at Media after plans prepared by Architects Yarnall & Goforth, of this city. A new chapel to be built at Forty-seventh street and Kinsessing avenue is being planned by Architect R. G. Kennedy. A handsome 4-story store will be erected on the east side of Broad street, south of Chestnut, by I. Wallace Hallowell. Architect Addison Hutton has plans for the new school of physical culture to be erected at Sixteenth and Race streets by the Friends. The structure will be three stories high, of brick with ornamental stone trimmings. Work has been started upon a new club house, to be erected at the south east corner of Broad street and Ridge avenue by M. M. Owens. It is proposed by the plans to have a building that will accommodate six or eight clubs comfortably. The drawings were prepared by Architect Isaac Pursell.

SEWERAGE NOTES.

Boston, Mass.: The city engineer has asked for an appropriation of $240,472 to complete the improved sewerage system.——Providence, R. I.: An appropriation of $75,000 has been made for additional sewers.——Pawtucket, R. I.: The sewer commissioners are considering plans for sewage disposal.——Bridgeton, N. J.: A survey is to be made for a new sewerage system.——Weehawken, N. J.: Steps have been taken toward the establishment of a sewerage system.——South Orange, N. J.: A citizens' committee has been organized to aid in the establishing of a sewerage system. Address H. A. Mandeville for particulars.——Ukiah, Cal.: A sewerage system is projected.——Freeport, Ill.: The Council has engaged Mr. Arthur Lagron, of Rockford, to prepare plans and specifications of the sewer system.——Des Moines, Ia.: The City Engineer has prepared plans for sewers for North Des Moines.——Springfield, Mo.: Mr. Johnson is preparing plans for sewer work, and contracts will probably be let soon.——Mobile, Ala.: The Mobile Sewerage Co., has been incorporated by G. R. Gage, J. K. Glennon and P. L. Lyons, of Mobile, and J. E. Lewis, of New York.——Ann Arbor, Mich.: A committee has been appointed to examine the sewerage systems of Jackson and Kalamazoo.

HEATING AND LIGHTING.

New electric light plants and extensions of existing systems are reported as probable in the following places: Riverside, Tex.; St. Bernard, La.; Washburn, Wis., address A. C. Probert; Rawlins, Wyo., address Dr. J. E. Osborne; Wilmington, O.; Hamilton, O.; Le Mars, Ia., address J. W. Winchell; Wheeling, Pa., address the Ætna Mill Co.; Sullivan, Ind.; Ensenada, Cal.; Georgetown, Tex., address John Steele; Toledo, O., address the Toledo Electric Co.; Seymour, Ind., address W. H. Shields; Quanah, Tex., address J. J. Combs; Wiconisco, Pa., address the Williams Valley Electric Light, Heat & Power Co.——High Point, N. C.: At a recent meeting of the City Council E. A. Snow and J. E. Cox were appointed a committee to purchase a municipal lighting plant.——The following electric lighting companies have been organized: New Companies—National Gas & Water Co., Chicago, Ill.; capital stock, $500,000; incorporators, C. D. Hank, E. E. Morrell, N. E. McClary; to operate gas, water and electric works. Columbian Electric Works, Chicago, Ill.; capital stock, $3,000,000; incorporators, S. E. Moore, L. S. Day, J. Irvine. Empire Electric Co., Chicago, Ill.; capital stock, $1,000,000; incorporators, C. E. Gaylord, C. N. White, M. J. Frost. World's Incandescent Lamp Co., Chicago, Ill.; capital stock $100,000; incorporators, G. W. Waite, M. M. Tilton, J. H. Park. Poland & Minot Water, Electric Light & Power Co., Mechanic Falls, Me.; capital stock, $25,000; directors, J. Hanscom, L. Perkins, A. E. True, N. Q. Pope, J. M. Libby. Waynesboro (Va.) Street Railway, Light & Water Co.; capital stock, $100,000; incorporators, W. N. Fishburne, R. G. Wright, W. B. Gallaher and others. Herzog General Electric Co., Newark, N. J.; capital

stock, $1,000,000; incorporators, F. B. and P. Herzog, of New York; G. G. Frelinghuysen, of Newark. Carolina Light & Power Co., Aiken, S. C.; capital stock, $20,000; incorporators, B. F. Turner, H. Hahn, B. F. Henderson and others. Armour Electric Light, Fuel & Power Co., Chicago, Ill.; capital stock, $5,000,000; incorporators, W. L. Armour, M. C. Burt, A. T. Bennett, C. O. Scudder. Economic Light & Power Co., Charleston, S. C.; capital stock, $100,000; incorporators, W. St. J. Jervey, C. C. Miller. W. E. Holmes. National Electric Co., Alexandria, Va.; capital stock, $1,000,000; President, P. Mason; Secretary, W. J. Dante. Edison Light & Power Co., San Francisco, Cal.; capital stock, $3,000,000. Topeka Water & Electric Power Co., Topeka, Kan.; capital stock, $500,000. Delhi (N. Y.) Electric Co.; capital stock, $30,000. River Falls (Wis.) Light, Heat & Power Co.; capital stock, $80,000; incorporators, F. J. Burhyte, R. N. Jenson, W. W. Thayer and others. Franklin (Ind.) Water, Light & Power Co.; capital stock, $100,000; secretary, M. L. Johnson.

WATER WORKS NOTES.

Franklin Falls, N. H.: Extensions to cost about $5,000 will be made.——Hudson, N. H.: G. O. Sanders wishes to buy one-half mile of 6 and one mile of 4-inch pipe.——Rochester, N. H.: The mains will be extended and a stand-pipe used.——New Bedford, Mass.: Petitions for mains on several streets have been granted. ——Buffalo, N. Y.: A 20,000,000-gallon pumping engine may be bought.——Susquehanna, Pa.: The New York, Lake Erie & Western Ry. Co., it is reported, is negotiating for the purchase of Fox's Pond, 5 miles distant, to supply its shops and locomotives. It is hoped that an arrangement for a village supply can be made. ——Amenia, N. Y.: The Amenia Water Co. has been incorporated by Charles Walsh, Georgia Walsh and B. H. Fry.——Reading, Pa.: At an election July 14 it was voted to issue $150,000 of bonds for the laying of larger mains and connecting the Maiden Creek pumping station with the Hampden reservoir.——Knoxville, Pa.: Works are projected. C. F. Billings, Elmira, N. Y., is interested.——Butler, Pa.: The Mutual Water Association proposes to supply its members with water for fire and domestic purposes. Thus far all members live in the section of the city called Springdale. An 8-inch well 500 feet deep has been sunk on a hill 260 feet above the city, and a tank will be erected and mains laid. Estimated cost, $13,000. Contracts will probably be let August 1. ——Cranford, N. J.: A public meeting was held July 16 to consider the construction of works. A state charter, granted in 1870, is said to be still valid, and subscriptions for stock are solicited. ——Wickford, R. I.: Works are talked of.——West Carthage, N. Y.: Works to be owned by a company are projected.—— Southampton, N. Y.: It is reported that a water company will be formed.——Cattaraugus, N. Y.: W. J. Weed, town clerk, informs us that E. L. Johnson is president and L. H. Northrup treasurer of the new water company.——Mechanicsville, N. Y.: Surveys for works are being made.——Johnstown, N. Y.: Work will soon be started on a reservoir estimated to cost $7,000.——Washington, D. C.: A main 20 to 12 inches in diameter will be laid to Anacostia at an estimated expense of $37,000.——Mannington, W. Va.: F. R. Stewart, president, informs us that the Mannington Water Supply Co. proposes to build fire protection works at a cost of from $5,000 to $10,000. Water will be pumped from Buffalo Creek to tank. Population, 2,000.——Nescopeck, Pa.: We are informed that the Nescopeck Water Co. has been incorporated with S. P. Hanley, president, and F. H. Eaton, Berwick, treasurer; capital stock, $5,000, of which $2,500 is paid in.——Sellersville, Pa.: Works are wanted.——Huntsville, Ala.: E. R. Hartford, Chattanooga, has recommended the purchase of new pumping machinery and a stand-pipe.——Statesville, N. C.: C. H. Armfield, mayor, has sent the following: The aldermen have been authorized to pay an annual hydrant rental of $3,000 for 50 hydrants to any company who will build works. In the near future bids will probably be asked. The supply will be pumped from a creek 2½ miles distant to a stand-pipe. Estimated cost, $2,500; population, 3,000.——South Jacksonville, Fla.: The South Jacksonville Water Works Co. has been incorporated by B. S. Partridge, C. E. Garner and others; capital stock, $5,000. The supply will be from an artesian well. About 6,000 feet of mains are proposed.——Port Gibson, Miss.: A franchise has been granted and a company to be called the Holly Water-Works Co. will be organized. About 1½ miles of mains will be laid and 17 hydrants placed.——Smith's Grove, Ky.: New works are proposed at a cost of $10,000. Address S. L. Casey or W. F. Storm.——Greensville, Ohio.: Works are projected at an estimated cost of $50,000.——Hillsborough, Ohio: The council has the matter of water-works under investigation.——Nappanee, Ind.: Works will be put in at a cost of $10,000.——Paw Paw, Ill.: It is proposed to pump water from a well to a tower.——Metropolis, Ill.: Bids will soon be asked for the construction of water-works.——Tomahawk, Wis.: The city has voted $16,000 for water-works.——Northfield, Minn.: Preliminary plans for works are being made.——Lexington, Neb.: Bonds for works have been issued.——Ponca, Neb.: Bonds for new works are being offered for sale.——Casper, Wyo.: In August the city will probably let contracts for works to cost about $10,000.——Brookfield, Mo.: The council is considering an ordinance authorizing a popular vote on the issuance of $25,000 of water-works bonds.——Helena, Ark.: The council will grant a franchise to the first party applying who will put up $5,000 forfeit, put in 6½ miles of mains and accept $3,000 a year for about 80 hydrants.——Fort Worth, Tex.: The plans for new works, submitted by the American Water-Works Co., provide for a supply from artesian wells at an estimated cost of $1,000,000. There is also under consideration a plan for 24 storage reservoirs, each with a capacity of 50,000,000 gallons.——McGregor, Tex.: The McGregor Artesian Water Co. wishes to issue $10,000 in bonds to put in mains and a stand-pipe.——Waco, Tex.: An issue of $100,000 in bonds will be made for water-works improvements.—— Seattle, Wash.: Bids are wanted for a 5,000,000-gallon pump.—— Snohomish, Wash.: The council wishes to secure plans for works to be owned by the town.

BIDS AND CONTRACTS.

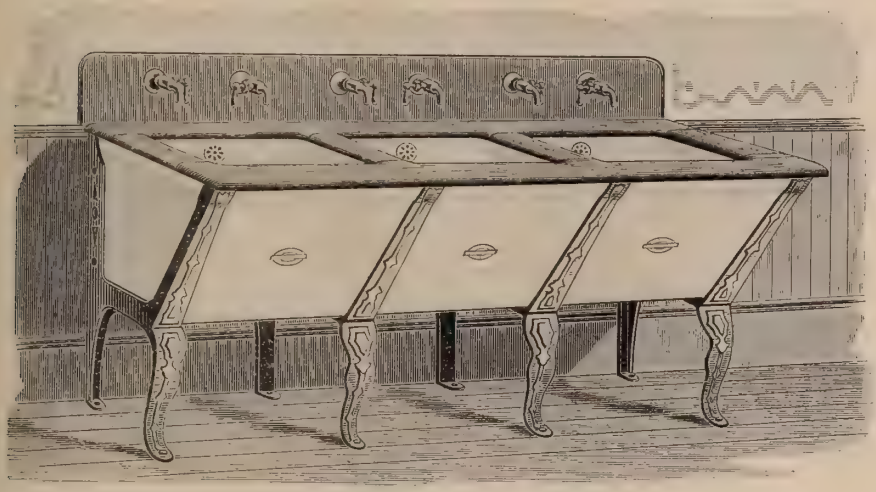
Elgin, Ill.: Bids are wanted until August 4 by the Trustees of the Illinois Northern Hospital for a 100,000 gall. stand pipe. H. J. Brooks, superintendent, can furnish particulars.——Hammond, Ind.: Bids are wanted for 8.000 feet of brick sewer, on or before July 27.——Grand Forks, N. Dak.: The city council of Grand Forks, N. D., will receive sealed proposals for the construction of sewers according to the plans and specifications now on file and to be seen at the office of the city engineer and city auditor in said city. Bids will be received at the office of the city auditor until 4 o'clock P. M., Saturday, the 15th day of August, 1891, and will be opened and considered at 8 o'clock P. M. of said date by the city council, in the city hall, of said city. The successful bidder to enter into contract within 5 days from date awarded. Each bid to be accompanied by a bond in the penal sum of at least fifty per cent. (50 per cent.) of the amount of the bid, with approved sureties for the faithful performance of the work bid for, and to enter into contract within the specified time. All bids must be addressed to C. A. Hale, City Auditor, Grand Forks, N. D., securely sealed and endorsed on the outside "Proposals for construction of sewers in Districts No. 1 and No. 3." All bids shall be made on blanks furnished by the city engineer or auditor, and in strict conformity thereto, distinctly stating the price for each district separately.——Kankakee, Ill.: Bids for the erection of a hospital for the insane are open until Aug. 5. Address John L. Donovan, trustee.——Marion, Ohio: Bids are open until August 6 for the construction of a sewerage system. H. T. Snyder is city clerk.——Asawatomie, Kas.: Bids for the erection of a ward building at the insane asylum are open until Aug. 1. Address J. G. Haskell, State Architect, Topeka, Kansas. ——Findlay, Ohio.: Bids for the construction of brick and pipe sewers are open until Aug. 7. Marion G. Foster is city clerk.

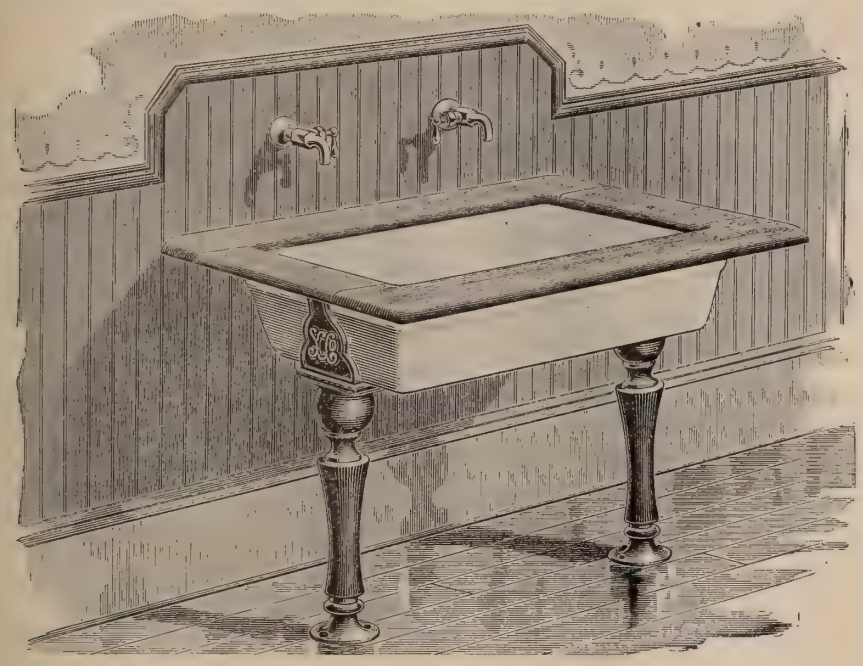
THE LARGEST PIECES OF CROCKERY MADE IN THE WORLD.

This country has the honor of producing the largest pieces of crockery made in the world in the forms of laundry tubs and manufactured by the Stewart Ceramic Company, and are not only extraordinary speciments of this ware, but are fixtures for the home which are always clean and healthful. It was known long ago that wooden devices were unsanitary on account of their absorption of filth and disease germs. In this and many other cities their use is rightly forbidden by ordinances, and a more solid material is used whenever the law is complied with. These facts have lead through years of experimenting, testing and investigation, to the production of the solid white crockery washtubs and sinks as at present manufactured by the above company. Iron and Iron-enameled and many forms of so-called porcelain wash-trays and sinks have been placed on the market, but all have serious defects. Iron will rust. The enamel will crack on

the enameled iron tubs, and the "porcelain" trays, which consist simply of a porcelain baked taken on to a body of ordinary fire clay, will not stand the changing temperature necessary in the use to which they are put, owing to the difference in expansion and contraction under heat and cold between the materials composing the bodies and the lining of such tubs. Soapstone and Slate Tubs are liable to leak at the seams (due to the action of the alkali in the soap upon the cement), and will sometimes crack.

Cement tubs are more objectionable still, from the fact that the free alkali of the soap, together with the infiltration of the water,





will in time disintegrate the material, rendering the surfaces rough, thereby causing absorption, and preventing thorough cleansing.

The Solid White Crockery Wash-Tubs and sinks manufactured by the Stewart Ceramic Company under Morahan's Patents for the past twenty years, are open to none of these disadvantages, and are sold at a much lower figure than the imported. The material is composed of china clays, which impart to its beautiful appearance, and such other ingredients as are used in the production of table-ware, viz., ground flint, feldspar, silica, etc., which give it its superior tensile strength.

The Glaze or Lining is of similar material and analagous to the body, being part and parcel thereof, and hence is not subject to difference in expansion and contraction by alterations in temperature. In cases where steam is used in connection with these tubs, therefore, no damaging effects will result so long as proper care is taken to submerge the pipe while the steam is turned on, in order to allow the tubs to heat somewhat gradually under intense pressure.

When Mr. Morahan, the patentee of these tubs, first introduced them, he tried to get them manufactured in this country but failed; he then applied to Messrs. Brown, Westhead & Moore, the largest firm in England who made such ware, and after an extended trial they wrote him to this effect:—"We have neither time, patience nor capital to make your tubs, and decline receiving any more orders." He then appealed to the present manufacturers for assistance in putting his tubs on the market, and they only succeeded in enabling him to do so after experimenting for nearly four years. Some time after, the English fire-clay enameled tub made its appearance, being the nearest imitation that could be gotten up, and followed but a few years ago by another of American manufacture, having the same component parts but much inferior in all other respects. A tub having a solid white crockery body hasnever been produced elsewhere than in this country.

Each tub is made in one piece, without seams to open, and of an imperishable material, well adapted to stand the alternations of heat and cold.

They are thoroughly glazed, rendering the surfaces very smooth and non-absorbent, thus insuring freedom from smell,—in a word, absolute cleanliness.

They are made very strong, so as to stand the roughest domestic usage.

Movable wooden wash boards are dispensed with, as in every set a tub is furnished with a perfectly smooth, moulded, corrugated surface on the inside front, which constitutes a very superior wash-board, having the advantage of not encroaching on the interior space of capacity of the tub. A mouldedrecess is formed in one corner of each tub for holding soap.

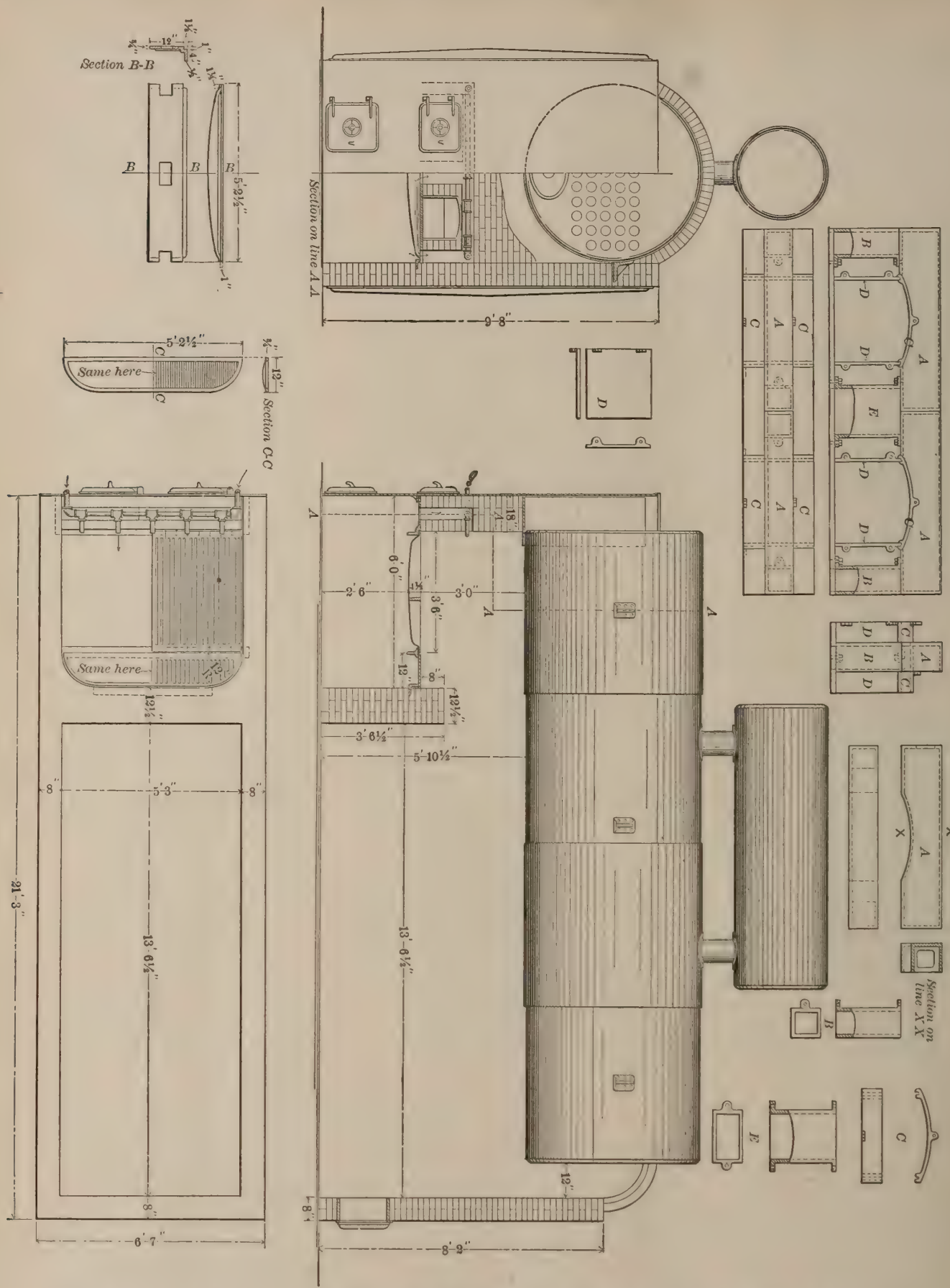
They are set up on galvanized iron stands, with a well-seasoned ash frame on top, thus permitting the use of any number of tubs desired, securing the necessary strength, presenting a neat and cleanly appearance, and affording no room for lodgment of filth or vermin.

This ware not only meets the requirements of modern sanitation but it is durable, and all things considered, is the most economical placed on the market. The company have numbers of letters testifying to the merits of these goods, and we know of no one acquainted with them who does not highly recommend them. The facts presented above are of interest to the householder who wishes his home provided with the best sanitary appliance at a minimum of cost. So popular have these goods become, and so extensive is the demand for them that new and much larger works are about to be erected by the company with increased capacity and facilities for their production and for the enlargement of the company's line in this direction.

The Eastern office is at 312 Pearl street, corner Peck Slip, New York. The Western office is at 323-5 Dearborn street, Chicago, and is under the management of Mr. W. H. Griffin, a courteous, fair dealing gentleman, and a communication sent to either office will receive prompt attention.

G. A. R. ENCAMPMENT AT DETROIT.

The Wabash Railroad is now generally recognized as the Grand Army Line. As a matter of principle, it always does everything in its power to favor that organization. Comrades and their friends who purpose attending the coming National Encampment at Detroit, August 3 to 8, should bear in mind that the Wabash is one of the principal lines between Chicago and Detroit, and offers equipment second to none. On August 1, 2 and 3, the Wabash Road will run regular trains from Chicago to Detroit, leaving Dearborn Station, Chicago, at 9:30 A. M., 3 and 10:30 P. M. In addition, such special trains will be run between the hours named as may be necessary to accommodate the public. Rate, one fare for the round trip. Equipment will consist of Palace Sleeping cars, Free Chair cars and Elegant Day Coaches. Send in your names for sleeping car reservations, stating which train you desire to leave on.



HUTCHINSON'S WATER GAS FURNACES.

The above cut is a detailed drawing of the Hutchinson Water Gas Furnace applied to stationary boilers. This is the only practical method of abating smoke nuisance on all constructions of furnaces. The system is just as applicable to locomotive or tug boilers as the stationary or returned flue boiler. The principal consists of converting a furnace into a Water Gas Furnace by supplying Oxygen and Hydrogen and taking up the Carbon as it is generated from the burning fuel. There are over 5,000 of these furnaces in successful operation, which is sufficient proof that it is no hardship to abate the smoke nuisance but on the contrary is a matter of economy to consume the gas under the boilers which usually passes of in the form of smoke and soot. Steam users generally speaking are scattering about 25 per cent. of fuel over themselves and neighbors. By the use of this device there is no fuel wasted, and all the gas is consumed immediately under the boilers leaving no soot or settlement to lodge in the flues or stick to the bottom of the boiler covering the surface of the iron with a non-conducting substance of greater density than

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The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

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Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to THE SANITARY NEWS.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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THERE is one thing noticeable regarding plumbers who are apace with the profession to-day: They understand not only the sanitary features of their own work, but are in a general sense sanitarians. The nature of their work leads them to become interested in the general sanitation of homes and communities, and thus we find them informed regarding about every service with which sanitary science has to do. We could hardly suggest a better person to go to for advice regarding sanitary matters than the plumber of to-day who has advanced with his profession.

THE plumbers in England are continually advancing with their system of licensing. They are working for a national system of licensing plumbers through enactments of Parliament. At every meeting held by the plumbers this matter is freely and strongly endorsed, and many influential sanitarians and physicians favor the movement. There are several reasons why such a system should succeed, and why it would be just as good for this country as for England. In the first place if any one working at the trade is not duly qualified to do plumbing work, he should not be permitted to do so, for he endangers the public safety and takes work away from qualified plumbers who should be permitted to do it. In the next place every properly qualified plumber is entitled to have some official guarantee of his fitness. When, by hard work and close study, he has gained that knowledge and experience which make him capable of doing safe plumbing work, he has well earned some official recognition of his qualifications that will recommend him to public confidence. A license to do plumbing work, issued from some established official source, is a guarantee that the holder of such certificate has proved himself worthy of public confidence, and it is a reward that all qualified plumbers are entitled to. Another reason for such license system is that it will protect the public from incompetent workmen. This the public is entitled to in all affairs effecting its welfare. Besides these reasons, it is clearly fair that the plumbers who push ahead and qualify themselves for the work they have undertaken should themselves be protected from the incompetent and untrustworthy who have spent but little time, labor and money in acquiring just enough knowledge of their trade to be dangerous. There seems to be every reason why some uniform and just license system should be established.

TO EVERY man in business his reputation is his capital to a very large extent. Where his business is such that it can effect others either for good or ill, then the man with a good reputation has a very large capital to work on above the man whose reputation is bad. The tailor who makes an honest suit of clothes, makes a customer with every suit. So with the plumber who does honest, competent work, establishes a continuation of business where he has once commenced it. Work talks, and a good job for one man recommends the workman to another.

DISPOSAL OF REFUSE IN AMERICAN CITIES.

The disposal of the refuse in cities, while it has been a problem in the sanitation of our larger towns, is yet to be solved. There is probably not a city of any size in the United States where the disposal of wastes is satisfactory or conducted in such a manner as to meet the demands of cleanliness and hygiene. If there is a perfect plan adopted, there are to be found defects in its execution which render ineffective the methods used. The report of Mr. Walter V. Hayt, General Sanitary Officer of the Chicago Board of Health, recently published, gives a summary of different cities as to their methods of "collection and disposal of garbage and refuse." From this we learn that in New York the garbage is collected by the city teams, loaded upon flat boats, removed to sea and dumped. The garbage is removed from Philadelphia by small contractors in a very unsatisfactory manner; some feed to hogs, others sell to farmers, and at times it is buried or accumulated on the ground awaiting slow decomposition. Cremation is recommended. In Brooklyn refuse is moved to the sea. Collections are made daily from hotels, from dwellings twice a week in winter and three times a week in summer. St. Louis collects its garbage and discharges it at certain dumps. It is not satisfactory and cremation is also here recommended. The following is said regarding the disposal of garbage in Boston:

"There are now about three hundred and fifty thousand loads

of garbage, ashes, street-sweepings, and other miscellaneous *debris* gathered up by the city teams annually, and carted away to different places and for different uses. The annual cost to the city in hauling this large amount of material is about five hundred thousand dollars, about one hundred thousand of which is spent in collecting garbage. With the growth of the city and the gradually increased distance to which such matter must be carried for disposal, comes a corresponding increase in the expense. The question occurs to us, cannot this growing expense be lessened, and much of the offense now attending the necessary storing of garbage in the houses and yards, and the hauling and carting of it in the streets, be avoided? It is found that with trifling cost in arranging the kitchen stove, each family can easily burn all its refuse as it is made, and before it becomes offensive, and thus save all subsequent expenses and nuisance incidental to its being kept on the premises for several days and then carried through the streets by the city teams." Baltimore says that "the present mode of disposing of the garbage, night soil and street dirt of the city, as at present carried on, though far from perfect, is, with our present facilities, the best our circumstances will allow. The offal and filth of cities *must* be deposited *somewhere* when gathered from every house and locality, and is from the very nature of things a nuisance to those who reside in the neighborhood of the dumps. Much, however, could be done in mitigation of this evil by more stringent regulations in the manner of removing both garbage, ashes and night soil. The garbage carts are very poorly adapted, in their present construction, for the transportation of garbage and ashes through the streets of the city, and are a source of constant complaint by citizens whose olfactories are greeted throughout the summer months by the odor of decaying vegetable and animal matter, and at all seasons saluted by a shower of dust from uncovered ash carts." In 1883 Cincinnati contracted with a private company for two years to remove, for the sum of $2,500 annually, all "vegetable garbage, dead animals and slaughter-house offal within the limits of the city." The company must remove all animal matters from dwellings and hotels at least three times a week, and daily from all slaughter-houses. Ashes and other refuse must not be mixed with vegetable garbage. It is said that the city has the best end of the contract. The Cleveland method is as follows as taken from the report: "*Something Necessary?*" "A long delayed sanitary necessity remains unprovided in this city, to-wit: A satisfactory gathering of house garbage. No city of this size can be considered well taken care of which makes no public provision for this purpose. Private methods are entirely inadequate and mainly efficient for the prompt and cleanly removal of such material. It is an old topic in these reports, but must continue to be urged until some relief is obtained. Whatever disposition is finally made of garbage, a systematic gathering should be inaugurated as speedily as possible. At present we are without funds for such service, but could money be better employed for the real welfare of our citizens?" From the report it is gathered that the total cost of the scavenger service in Chicago for the year 1889 was $253,140.72. The area covered aggregated 174 square miles, including in this 2,047 miles of streets and about 3,000 miles of alleys. It is admitted that this service is only "fair." In one ward only is there a daily service; outside of this it was tri-weekly. About 225 teams have been regularly employed by the contractor to whom this collecting is let, and by the city, and an average of 2,000 cubic yards per day is removed and deposited in clay holes, removed by train beyond the city limits, or from Feb. 19 to Oct. 15, 1890, burned by the Chicago Garbage Reduction Co. This company burned 7,208 tons of garbage in this period. For the year 1890 a total of 325 teams was demanded, and Mr. Hayt recommends radical improvements in the contract system of collecting, "if that is to be continued." These recommendations cover the employment of a minimum number of teams, a wagon box of standard size, with a proper canvas cover, wagons to be plainly marked with ward and number.

In all the cities cited the methods of disposal are not satisfactory in one. The method adopted or the service rendered is at fault. The lack of funds is responsible in some instances for the deficient work in the disposal of garbage. In the first place there is too much garbage produced, and in the next, that which must necessarily be produced is not properly cared for, and the problem, how best to dispose of the refuse of cities is still unsolved. The fact is some garbage must be produced, and we do not believe that any method which does not look to the destruction of this garbage will be a success.

NOTES AND NEWS.

Onyx is in danger of losing its special value. Besides the great deposits discovered in Missouri extensive layers have been found in Smyth county, Virginia.

"In France at present there are 2,000,000 households in which there has been no child; 2,500,000 in which there was one; 2,300,000, two children; 1,500,000, three; about 1,000,000, four; 550,000, five; 330,000, six; and 200,000, seven or more."

The American Electro-Therapeutic Association will hold its first annual meeting at the hall of the College of Physicians, corner Locust and Thirteenth streets, Philadelphia, Pa., Thursday, Friday and Saturday, September 24th, 25th and 26th, 1891, under the presidency of Dr. G. Betton Massey.

Adulteration of food is an industry carried on in Massachusetts to an alarming extent. The State Board of Health finds that in a list of twenty of the most common articles of food used in every household the adulteration amounts to 32 per cent. It examined 434 specimens gathered at random, and of these 139 were more or less adulterated. Canned goods were the special prey of dishonesty, only one-seventh of the specimens being worthy of the seal of approval. Milk was also found to be badly adulterated. Curiously enough eight of eleven samples of coffee were reasonably pure; also a majority of the samples of spice, cream of tartar, molasses, and drugs. The samples of tea, cheese, and maple sugar were not adulterated.

All users of steam boilers are troubled with scale or incrustation, in spite of the many remedies in the market. There is in reality no specific for incrustation; different waters require different treatment. A boiler composition may give excellent results with one water, while with another it may increase rather than lessen the scale. Steam users are, therefore, recommended to have the water analyzed before use, and to have a remedy prepared by those thoroughly conversant with the subject, and who will make a special preparation at such a reasonable cost that it can be economically used in quantities sufficient to completely prevent the crustation.

Water extinguishes fire, not, as the common talk is, by virtue of any incompatibility between the two elements, but partly by the effect of the lowering of the temperature caused by its evaporation, and partly by acting as a mechanical extinguisher. Enveloping the parts of the body upon which it is thrown, it separates the combustible matter from the atmosphere, and cuts off the supply of oxygen—the life of the fire.

M. Berthelot has been investigating the cause of that peculiar and far from unpleasant odor which arises when vegetable soil is moistened. It proves to be produced by a camphor-like substance existing in extremely minute proportions—only a few millionths—exact analysis of which has not been practicable, on account of the small quantity obtainable. The author did not find the alcohol in the soil that M. Muntz claims to have detected there, and regards that found by M. Muntz as only an exceptional product of the spontaneous fermentation of vegetable *debris*. The new odoriferous body has a similar action with alcohol in producing iodoform.

Fromentine is the name of a new food-substance which Dr. Dujardin Beaumetz prepares by extraction from the embryos of grain seeds. On subjecting the mass obtained by collecting the embryos to a slight cooking, the proportion of albuminoid and nitrogenous substances is augmented. The water is evaporated, and the fat is separated by pressure or solution, when as much as fifty per cent of albuminoid matters and twenty-seven per cent of ternary substances are obtained. The new product contains twice as large a proportion of nitrogen as meat.

The *Popular Science Monthly* says: While local farmers and butchers in the United States are pretending to adduce sanitary reasons for discouraging the use of meat that comes in refrigerating apparatus from a distance, the Lancet uses them in support of the transportation of all meat to the market in that way instead of bringing the cattle alive. It assumes that it would be much

fairer to consumers to interdict the importation of living animals as food, and to insist upon receiving carcasses only. This would certainly lead to the abolition of the hardships and sufferings the poor brutes now undergo, would insure better meat, and would avert the introduction of contagious diseases which have already impoverished British agriculture, and which require the maintenance of an expensive system of inspection at ports all round the coast of the country. "The middle-man might perhaps complain; but as he is, so far as we can see, the only one who profits from this stupid and cruel business, we need not consider him in the matter."

REPORT OF CHAIRMAN J. J. WADE OF THE DELEGATION TO THE CINCINNATI CONVENTION.

READ BEFORE THE CHICAGO MASTER PLUMBERS' ASSOCIATION JULY 23, 1891.

Gentlemen: As chairman of the Chicago delegation to the Cincinnati Convention, in the absence of President Whiteford, I have the honor to submit the following report for your approbation. I am keenly alive to the fact, that, had our honored president been present on the occasion, the report would be not only more complete but exceedingly superior to any attempt of mine; and I am sure that I but echo the opinion of each gentleman constituting the delegation, when I say that though absent from view he was ever present to our minds, and that his words of intelligent advice were constantly missed from our counsels.

The Chicago delegation came together at the Illinois Central depot, Sunday morning, June 21st, all ready to sustain the reputation of Chicago, and each man feeling that the honor of the World's Fair city depended upon himself. Just previously to taking the train the ladies, or better, the "Ladies' Auxiliary," wishing to show their appreciation of the honor that had been conferred upon one of the delegation at Denver, presented the honored chairman of the convention with a beautiful gavel, knowing well that he would use it in a manner that would reflect credit upon himself, the city of Chicago, and the National Association. And if it were not a fact that Mr. Griffith is a married man already, the gavel would be significant of the loud tattoo that he beat upon the hearts of the ladies of Cincinnati while conducting the deliberations of the convention. But as Mrs. Griffith was present the gavel sent back an empty echo, since it did not strike a responsive chord in Mr. Griffith's breast.

But we are wandering from Chicago to Cincinnati and the declivity is as yet a little too steep, so let us retrace our steps to the depot. Mrs. Irons made the presentation remarks in a graceful and attractive manner, and Mr. Griffith answered with an eloquence peculiarly his own.

The trip to the Queen City was thoroughly enjoyed by both the ladies and gentlemen, and this was due to the unwearied efforts of the gentlemen of the culinary department. They excelled themselves in their care of the delegation, and the ladies praised both gentlemen in a manner that made the rest of us turn green with envy. But what contributed more than anything else to the envious feelings of the delegation, was the exceedingly handsome appearance presented by ex-Alderman Patrick Sanders, who, with his white hat, coat and cane, far surpassed the other members.

At 6 P. M. we arrived at Cincinnati, and were received with open arms by the reception committee, who escorted us to the Gibson House, and showered upon us every form of hospitality known to the heart of man.

One of the greatest pleasures associated with conventions like ours is that of meeting old friends from different portions of our broad land; recalling the days of "Auld Lang Syne," and rehearsing over again the many happy incidents connected with our days of apprenticeship. The cordial greetings, the fellow-feelings of friendship that are established and maintained by these annual conventions, would be sufficient of themselves even apart from our trade interests, to prompt us to come together at least once a year. Who would now go back to the days when conventions were something unheard of among us? When that spirit of helpfulness which now forms such a prominent factor in our progressive growth and development was lacking, when we acted as dissevered units and not as members of a glorious and harmonious organization; an organization that welds us more closely together year after year, that has thoroughly obliterated the petty jealousies and personal hostilities that in days now, thank God! are long gone past; that has brought us before the people as men who have the best interests of the community at heart, that has animated us with a spirit of intelligent conservatism, so that to-day we occupy a position second to no other organization; and if in future years we only carry on and are animated by the principles which have actuated our conduct in the past, the superior order of intelligence generated by our annual conventions will redound to the credit of our society and of each of its individual members. But, gentlemen, pardon this digression.

On Monday the delegations from different portions of the country arrived, and were greeted hospitably by the waiting committees. They were shown to the different points of interest about the city, and it is but fair and right to acknowledge the most cordial manner in which all were received by the Cincinnati citizens. On Tuesday morning the different delegations with banners flying to the breeze (and how glorious the Chicago boys looked with their beautiful silk flag leading the other delegations, even as their city will soon in commercial enterprise lead the world!) proceeded to the hall where the convention was duly opened by Mr. Gibson, of Cincinnati, who, in eloquent words and beautiful phrases, welcomed the "plumber boys" to the Queen City. Being one of ourselves he was received with the greatest applause and in a manner that showed the high appreciation in which he is held by the association. He was followed by the Mayor who granted us the freedom of the city, and told us we would be well taken care of provided that any of us were not able to take care of ourselves. Then our excellent President, Robert Griffith, declared the convention opened, and the delegates proceeded to business.

It will not be necessary for me to enter into a detailed description of the papers read, or the general business transacted by the convention. Suffice it to say that it was one of the most successful conventions ever held under the auspices of our organizations.

The papers were of a high grade and showed a remarkably business-like character, while the deliberations in general were superior to any convention, excepting the famous Baltimore convention.

To the citizens of the Queen City our heartiest acknowledgments are due for their great kindness and consideration. On every side everything that could in any material way contribute to our entertainment and comfort was accomplished. Who can forget the beautiful sail on the Ohio River; the myriad lights that shown from the passing boat; the beautiful music that set so many feet tripping; above all the magnificent hospitality seen on every side made our visit memorable in the annals of the convention. To the ladies of Cincinnati our most grateful appreciation is due. They treated the ladies of our delegation with the greatest kindness and sympathy. They were ever ready to receive them with open hearts; they introduced them to the sacredness of their homes, and in every way testified by their kindly manner their esteem and affection for the Chicago ladies.

J. J. Wade,
Chairman of Delegation.

REPORT OF SECRETARY T. P. CULLOTON OF THE CHICAGO DELEGATION TO THE CINCINNATI CONVENTION.

READ BEFORE THE CHICAGO MASTER PLUMBERS' ASSOCIATION JULY 23, 1891.

To the Chicago Master Plumbers' Association, Officers and Brothers:

We your delegation to the 9th Annual Session of the National Association of Master Plumbers of the United States, assembled at Cincinnati, Ohio, June 23, 24 and 25, 1891, wish to submit to you our report as follows:

We met in club room of the Grand Army Hall, May 26, 1891, at 3 P. M., with the following members present: J. J. Wade, H. Watt, Andrew Young, J. Matthews, M. Mandable, D. Whiteford, J. R. Alcock, T. P. Culloton, D. J. Rock, C. Sanders, J. J. Hamblin, Robert Griffith, J. Weber, W. Bowden, T. E. Boyd, C. Redeiski, T. Kelly, Chas Byrne. David Whiteford was elected Chairman, T. P. Culloton, Seretary, William Bowden was elected Commissariat with T. C. Boyd as Treasurer. J. J. Wade was appointed to draft an essay on "Licensing of Plumbers" for submission to the National Convention. T. P. Culloton was appointed to pre-

pare a paper on "Close Organization." M. Mandable was appointed to prepare paper on "Sanitary Laws." William Bowden was appointed on "National Protection." All of the above were submitted except the "National Protection," a copy of which will be found in the journal of the proceedings.

Your delegation had several meetings thereafter, at which the principal business was arranging for the trip, and it was agreed upon to go by way of the Big Four and wear white plug hats, linen dusters and canes.

Your delegation met Sunday morning at 9:15 A. M., the 21st of June at the Illinois Central Depot, and chartered two chair cars for more convenience of travel. Assembled at the depot to bid us farewell, were many of the Chicago plumbers, also the ever entertaining Ladies' Auxiliary Club, to present to our worthy National President a gavel beautifully carved and decorated, at the sight of which Robert was amazed, and said he would use it with great tenderness and caution considering whence it came.

Accompanying the delegation were several of their wives and daughters, also the Milwaukee delegation. A very delightful trip it was through the greatest cultivated fields on this globe, the weather being at its best, but a little might warm, but the conveniences of travel in a chair car made the heated atmosphere appear like an Arctic zephyr, with the delegates and their accompanying companions seated leisurely in the well provided comforts of a chair car. Who among us could have felt anyway else but cool with the genial and accommodating Commissariat at our elbow with some of the luxuries of life on such occasion. And well was our Commissariat encouraged in his endeavor, for at the end of our route nothing remained but a few sad looking bottles to tell the tale of that eventful ride. Nothing marred the harmony of the trip except the lack of a dining car, for which we must censure the management for they promised us faithfully there would be one attached. The loss was partially made up by the buffett, but many were the expressions anything but thankful to the agent for not providing us with proper dining accommodations. But our Commissariat made up after all for our sorrow by cracking another bottle.

Arriving at Cincinnati Sunday evening at 6:30 P. M., we were escorted to the Gibson House by the Cincinnati delegation, and there it was that the boys laid hold and made up for what they missed en route, as the hotel clerk sized us up and saw we were a hungry looking crowd, and taxed us $3.50 per day. After having the inner man satisfactorily attended to and the accumulation of dust as is wont to encircle the traveler disposed of, then it was that we showed up in our prettiest, for, gathered around the portals of the Gibson House, were the wealthiest dignitaries of the land, as was the presumption of the Cincinnati press. Who could question their audacity for such a presumption, when one gaze on our esteemed Sanders would set all variances with such at naught? But the portals of the hotel were not interesting enough for all, the sights of the curious were not satisfied until the striking figure, youthful and resolute face of M. L. Mandable tendered an invitation to cross the Rhine. Then it was that Brother Boyd appeared in his true and entertaining style, for, associated with the mirthful crowd, he felt like a two year old.

It was all hours when you would see the delegates returning to the hotel from seeing the sights, for many there were to see in the various attitudes the land assumes in all parts of the town. Here you would find a street with buildings, their entrances on a level with the street and the rear of same would be three or four stories of basements, and the next street would run hundreds of feet above with cables and electric roads winding and turning up and down, now through valleys thence over hills until you would wonder how they could propel and keep them in running order, which required a great deal of mechanical ingenuity to operate successfully. Monday morning found the boys rather late in responding for breakfast as the duties of the day were such as not to require early rising, as the convention was not to open until Tuesday. But Brother Griffith, Alcock and Hamblin, as members of the Executive Committee, had a great deal of hard and arduous labor to perform; so they were conspicous by their absence from the merry places of interest in the early part of the week, which were freely patronized by the balance of the delegates.

Monday was spent in visiting the various places of interest such as the Zoological Gardens, Art Museum, Cottage and Walnut Hills, Water Works, Reservoir and many other places of note. At the Zoological Gardens the delegates met a very hard obstacle to overcome, namely the severing of affections of Mrs. P. Rooney from Brother Byrne. But after a good deal of persuasion, Charlie finally succumbed, and was induced to return to town with the delegation, but it was with feelings of remorse.

Tuesday morning found all the boys up bright and early and eager for the events of the day. After a fine parade in which the Chicago delegation loomed up in fine style, with its silk flag flying, under the guidance of our portly Sergeant-at-Arms, Brother Redeiski, each delegate arrayed in a bran new white plug hat. Who could not admire us as we marched along step by step in unison with the beat of the drum? Although the sun was pouring down a little above the 100 mark, we advanced all unconsious of the impeding heat until the Scottish Rite Hall was reached, where Thos. Gibson, president of the Cincinnati Plumbers' Association, welcomed the delegates and introduced the Mayor of Cincinnati, Mr. Mosby, who in a few remarks in which he gave to the delegates the freedom of the city (which was very freely accepted by some), and concluded with that old chestnut, that he didn't pretend to know much about plumbing, but presumed it must be of some importance by the size of the bills he has had to pay. Then our Robert took hold and in eloquent language reminded the members that they were assembled here for thoughtful, earnest and intelligent discussion of all the many details that enter into our work; plumbers from every state and territory throughout this broad land meet to exchange ideas and learn something; that there was a great deal of hard work to be performed, and by close attention could be accomplished more readily. After explaining how and where he had been presented with the gavel he was to wield during the convention, the hammer of which was made from timber of the broken dam at Johnstown, and the handle from a tree on Pikes' Peak, the highest in this country, the convention settled down to business, which will be hardly necessary for me to follow as the same will be found in the journal of the proceedings. Tuesday night, by the kind invitation of the Cincinnati Entertainment Committee, we were tendered a steamboat ride on the Ohio to Cooney Island, where the boys amused themselves in the different games for a couple of hours, when the boat returned in time to give the weary travelers (worn out from arduous duties in a sweltering convention), the requisite amount of sleep. But a great number of the delegates had to do some very quick sleeping for the short period of time allotted for it. Wednesday morning found all the delegates at their posts as usual regardless of the continuous sweltering effects of the heat which seemed to have a mortgage on the 100 mark without any redemption. At the noon adjournment an invitation was extended by the *Metal Worker* for the delegates to assemble at the Music Hall where a group picture was taken, one of which accompanies July 11th edition of the *Metal Worker*. Wednesday evening the steamer State of Kansas was placed at our disposal by the Cincinnati plumbers. A very delightful ride it was gliding along in the wake of the great golden moon almost full with its vistas of beautiful light shed on the quiet waters of the big Ohio. The harmony rendered the beautiful scene by the Cincinnati orchestra was very enthusiastically encored by the merry plumbers and plumberesses. Dancing was indulged in by the younger members all through the ride, and right here let me state that a good many of the older members in years felt like of yore and led some of the pretty sweethearts of the Cincinnati plumbers through the mazy waltz. There was Wade dancing with every young girl on the boat. Tom Kelly silently whispering encouraging words in engaging for the next dance some young plumber's wife; even J. J. Hamblin trotted a heat in the enticing quadrille; J. Matthews was handled like a rubber doll in the three-handed reel with Weber and Redeiski. This was not all that the Chicago boys patronized freely, but you ought to see them lay hold of the ice cream, lemonade and cake, and how quickly they made it disappear. It was past midnight when the boat returned to the wharf, but so thoroughly enjoyable had the local committee rendered every detail of the ride that the hours flew only too quickly.

Thursday morning opened up beautiful and warm as usual, in the handsome auditorium of the Scottish Rite Cathedral, which wore an air of pensive gravity as motions, resolutions, essays

recommendations, speeches, discussions and tedious though important reports were poured forth in its midst. It was a day of work. The late sleepers dropped in from time to time until almost the full quota was on hand. The amount of work done was something enormous, which I will not attempt to produce to you as you are familiar with or can become so by referring to proceedings of convention. Due to the admirable manner of weilding the gavel and ruling of President Griffith, closed one of the most harmonious conventions in the history of the National Association of Master Plumbers. May good results be the reward, may the Executive Committee have life and strength to promulgate throughout the country the many recommendations for the future welfare of us all, and that when another convention is called together at Washington in 1892, we can say to the officers of this year "well done good and faithful servants, you have done us good service."

While we were assembled in convention the lady escorts of the many delegates were well provided for by the Entertainment Committee of the local association, who were untiring in their efforts to see all were properly entertained. Among the many places of interest they had them visit was the Art Museum, Zoological Gardens, carriage ride and lunch at Burnett Woods, banquet at Gibson House and many others too numerous to mention. But Friday's outing at Woodsdale capped the climax of entertainments, for, as Andrew Young said, "where could you find a fairer spot to banquet us than on God's green carpet." Few fairer spots can be conceived for such an event than Woodsdale Island, for there nature's great advantages for enjoyment have almost been surpassed by the artifice placed there by kindly mankind for public enjoyment. Here the sylvan shaded waters of the Big Miami wander in quiet peacefulness as though springing out to welcome the beautiful groves around it; here gathered the gallant plumbers, their wives and sweethearts to spend the last day of their stay in Cincinnati. The day was spent in the various sports arranged for the ocasion. There was the tin-type booth, a dancing pavillion, swings between the boles of tall tress, canes and rings, nigger babies and balls to throw at them, razzle dazzle, boating, foot ball, shooting gallery and other sports too numerous to mention, refreshments of all kinds free to all. Then there were the contests for prizes, the ladies donkey race in which our Mrs. Cavanagh carried off the prize; the fat man's race in which our Sergeant-at-Arms, Brother Redeiski, was the best sprinter of his class, but the committee without due diligence let in sprinters without any respect to weight, so that there was at least 100 pounds difference in some so that we lost the contest for Chicago. But through the efforts of our handsome and affectionate Harry Black we came out again with high honors for he outdistanced them all in the swimming match. In the boat race our Wm. Bowden run against a snag, but he looked like a veteran boatsman; had he been more fortunate and come in first he would have won the prize. Several other prizes there were for different contests, but we failed to carry off any more. The places of amusements were well patronized, also the refreshment booths until the time arrived for our departure to the city. In a few well worded remarks Brother Griffith thanked the Cincinnati plumbers and their friends for their untiring efforts for our entertainment while in Cincinnati, and then it was that the plumbers regretted, as they separated at nightfall, that life could not be a ceaseless picnic. Thus wound up one of the happiest gatherings that could be imagined and many a day will pass by before Cincinnati and its kind and generous plumbers will be forgotten; and the many pleasures that were extended to us will be remembered through the declining years of our life-time.

In extending to the local committee of Master Plumbers of Cincinnati our heartfelt thanks for their endeavors and hard and expensive labors in our behalf, we remain,

Fraternally Yours, T. P. Culloton, Sec.
Chicago Delegation.

SEWERAGE OF THE WORLD'S FAIR GROUNDS AND BUILDINGS.

Engineer McHarg will give an object lesson for the first time in the United States in the disposal of sewerage by the filtration method. The sewerage of buildings and grounds will be conveyed to tanks or basins and treated by several of the processes now in use in Europe. But experiments will also be made in new and original methods in this direction. Public attention is now awakened to the magnitude of the evils of the pollution of our rivers and streams by sewerage. Few more interesting features to the practical sanitarian than this will be met in connection with the construction of the buildings of the World's Fair. Practical sanitarians throughout the country will watch the outcome of these experiments. We have no doubt that under the skill of Mr. McHarg a new era may be developed in the disposal of drainage of towns and cities. Before spending millions in the disposal of our drainage under the new drainage board, would it not be well to aid or wait the results of experiments in this direction?

FOR A CLEAN CITY.

The Woman's Committee of the World's Congress Auxiliary having "municipal order" in charge, issued its program last week. Mrs. Henry Wade Rogers, wife of the president of Northwestern University, is chairman of the committee. Associated with her are Mrs. Charles Henrotin, Mrs. Joel D. Harvey, Mrs. J. M. Flower, Dr. Sarah Hackett Stevenson, Corrine S. Brown, Mrs. S. C. Tobin, Mrs. George L. Dunlap, Mrs. John Wilkinson, Mrs. H. M. Kinsley, Miss Frances E. Willard, Dr. L. G. Bedell, Mrs. Granville M. Holt, Mrs. Frederick P. Bagley, Miss Ada C. Sweet, Mrs. Ida Sullivan, Dr. Julia R. Low and Miss Jane Addams. The address issued to the public is as follows.

To the Citizens of Chicago: The city to which the United States bids all the world come to celebrate the 400th anniversary of the New World should be clean, healthful, and beautiful, the fitting type of a progressive, cultivated, and order-loving nation.

The World's Congress Auxiliary has appointed a Committee on Municipal Order composed of women, the purpose of which committee is to aid in the important work of cleansing the city and thus making it both more heathful and beautiful. While large sums of money are necessary to cleanse and keep clean a great city, it is submitted by those best informed on the subject that without the active co-operation of citizens generally, and of housekeepers in particular, all attempts to secure a clean and orderly city must fail to complete success.

The Committee on Municipal Order finds what must be apparent to the least observant citizen, that the streets of Chicago are dirty, the alleys an abomination, the garbage receptacle unsightly and unsanitary, and the removal and disposal of garbage utterly inadequate, while smoke and foul odors abound.

Admitting that the appropriation for this department of city work is insufficient for the proper care of this great city, and that ordinances are not as rigidly enforced as they should be, it is yet true that the unsightly and unhealthful condition of the city is to a certain extent due to the carelessness of the citizens themselves. The Committee on Municipal Order was appointed to secure the active co-operation of householders and citizens generally with the city authorities in cleansing and keeping clean the city, and in abating all nuisances detrimental to the healthfulness, cleanliness, and beauty of Chicago. It asks the aid of the women of Chicago, and the sympathy and co-operation of all order-loving citizens in its work.

The committee will co-operate with the city authorities to secure enforcement of and obedience to existing ordinances and the enactment of new ordinances. It will also seek the aid of organizations similar in purpose to the Municipal Order committee. The committee will endeavor to secure the active interest and aid of the people and the press in the work of cleansing the city, and will furnish the press from time to time with items, articles, and reports upon the subject.

It is further proposed to organize in each school or police district of the city one or more clubs, the objects of which shall be:

1. To create public sentiment for the enforcement of and obedience to the city health ordinances.

2. To promote among the members a clear knowledge of the laws of sanitation and hygiene; so that they will live in obedience to those laws.

3. To secure clean streets and alleys, freedom from street obstructions, proper drainage and plumbing, adequate water supply, sanitary garbage receptacles, and like reforms within the limits of the club districts.

The Committee on Municipal Order will hold the relation of a central committee or council to these clubs. It will direct the plans and work of the clubs, furnish information and speakers for them, and hold semi-annual meetings in each of the three divisions of Chicago for clubs within these divisions, and promote through these clubs the objects of this committee. A constitution and by-laws have been prepared for these clubs, and we earnestly ask the assistance of citizens in organizing and sustaining this practical educational work.

One-fifth of the street cleaning in London is said to be performed by boys. With a view to utilizing the youthful energy of our boy citizens in the good cause of a clean, healthful, and beautiful city the Committee on Municipal Order desires that boys under 18 years shall be organized into young citizens' street cleaning brigades. An interesting and practical plan of work is in preparation, and cannot fail to enlist large numbers of boys in this crusade against dirt and disorder.

The interest and aid of the girls in the work of cleaning the city will be sought through the Kitchen Garden organizations, the King's Daughters, and similar societies.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The howl that is going up from the dwellers by the lake on account of the dense volumes of smoke the lake craft send forth to pollute the atmosphere and injure property, is not without reason. The nuisance could be detected by a blind man, and to the eye of the passer by it is extremely offensive. To the inhabitants and property owners it is a pestilence, and we do not wonder at the steps being taken to put an end to it. It is an old proverb that what cannot be cured must be endured, and the truth of it can be accepted with complacency; but to endure that which can be cured is doubly galling. The smoke is sufficiently annoying to put one's religion to a severe test, but when it is known that these evils could be remedied and are not, then the burdens unnecessarily placed upon the people is a kind of a persecution which cannot be endured beyond the limit of Christian patience. A united effort on the part of the dwellers in the blackened locality in the strict enforcement of the law will do much to give them a clear sky and a purer atmosphere. The property along the lake front is valuable and great sums of money are invested there. This property is valuable on account of the lake view and the breezes from off the water. Destroy all this with clouds of smoke and the value of the property will be reduced and homes and buildings rendered uncomfortable, soiled and uninviting. People here have purchased the right of pure air, a beautiful lake view, clear sky and cool, fresh breezes, and a good price they paid for all these. To permit vessels on the lake to rob them of all this when there is no excuse for it, is a vexation and a loss sustained sufficient to cause an appeal to the protection of the law. The citizens are moving in the right direction, and a continuous assault on these producers of this great nuisance will soon bring the desired results.

The sentiment favoring the abatement of the smoke nuisance is rapidly growing in the cities throughout the country, but if efforts to abate it do not keep pace with the sentiment, little good will be accomplished. Letters reach us from cities which have no smoke ordinances asking for the best means for abating the nuisance. We might recommend all the smoke preventers in the country, and all the means now known and all the future will produce, and they would avail little where there are no laws designed to compel their use. To all such we reply, get ordinance against smoke adopted as the first steps in this important work. If there be no law compelling the abatement of the nuisance, the whole matter will stop there. A smoke preventer may be ever so efficient, but if there be no means of enforcing its use, there will but little good come of it. Men are not particularly obliging in this matter. It matters little to them how much smoke they produce, and it is idle to talk of them employing a consumer of their own free will. But when an ordinance is passed by which courts can have jurisdiction over the matter a means exists by which the efforts of the people can be of use, and the sentiment favoring smoke abatement can find substantial expression. All delay is but rendering the task more difficult. There must be a beginning sometime and the sooner the better. The smoke nuisance is like all other evils, the firmer its hold the more difficult will be its abatement. With all the laws necessary to enforce the use of smoke-consuming devices, there must necessarily be some missionary work done in the way of proper education as a preliminary step to the successful administration of the laws. Besides the abatement of smoke is not the work of a day or of a single effort. It takes time and continued efforts, and the sooner this work is commenced the more easily will it be accomplished.

Our opinion has been asked as to the efficiency and utility of a Citizens' Committee specially organized for the purpose of agitating the question of smoke prevention and the abatement of the nuisance. If citizens' commitees are really representative and popular, free from all taint of political purposes or class interests, they may be either of great service or of no account at all. This depends entirely on their efforts and the manner in which they are directed. Organization is effective only when its powers are directed to a definite proper end. The mere fact of the existence of such a committee will do no good. Its influence must be not only moral but it must also have a physical, active and aggressive nature. It must not only agitate, promulgate a healthy sentiment, but it must take hold of the matter with bare hands and compel a strict enforcement of every right under the law. The efficiency of such a committee will depend on its willingness and ability to work untiringly and incessantly. It must be watchful and active, prosecute every infraction of the law, and bring to the notice of smoke producers the means of smoke prevention. It must not depend upon its existence as a moral force, but rather as a physical power to be applied vigorously to the eradication of the smoke evil. Wherever smoke is discovered it must be fought as if it were a case of fire. Such a committee will accomplish much good.

The object to be gained in the abatement of the smoke nuisance is the employment of some device for its prevention. Smoke will not prevent itself. The ordinary furnace will not prevent it. We do not claim that every device placed on the market will prevent smoke, but we do claim that there are devices which will prevent it if given an opportunity. They have been thoroughly tested and are now in use doing good service, and when the warfare is begun on smoke producers, a knowledge of the merits of these devices should be known and the means employed to present efficiency fully to furnace owners. With these devices at hand and the conviction secured of their efficiency, the enforcement of the law will become a just and fair proceeding, and everyone can lend his influence to the cause freely and well.

The manufacturing interests of the country are good indices to the demands for any particular article. Invention as a rule works along the line of utility which leads to the use of new inventions. Take these two indications and we find that the abatement of the smoke nuisance has progressed to such an extent in this country that a very general demand for smoke prevention exists. The increase of manufactories, mills, and the like, where so much fuel is consumed and so much smoke produced, has made it manifest that some steps must be taken to prevent the evils arising from smoke, or people and property must greatly suffer. These steps have been in a rather investigating direction and many experiments have been the result. But from all this experience wisdom has been gathered which seems to point most directly to smoke consumption in the way of perfect combustion by some mechanical contrivance arranged to afford a combustion as nearly perfect as possible. The problem may be solved in another manner in time but at present these devices seem to offer the best solution known. With their improvement as experience points the way we can reasonably expect to find that the problem is solved.

In the discussion of this subject the *Iron Trade Review* says:

There is an opportunity for the Society for the Promotion of Atmospheric Purity, of Cleveland, to distinguish themselves in abating the smoke nuisance. It seems that it is impossible for any municipal corporation to succeed, whether from political reasons or whether it is from some unknown cause. It is not recorded that any municipal authorities have ever accomplished the work. The cities in Europe have ordinances now in force that were passed 70 years ago. The question has been agitated always by the municipal authorities, and upon each occasion when a move has been inaugurated by the authorities they have commenced in

the same place and in the same manner as their predecessors, and all wound up in about the same manner, and the smoke nuisance goes on forever. The principal cities in the United States, where bituminous coal is used for fuel, have ordinances for the suppression of the smoke nuisance. All such ordinances are in the hands of the municipal authorities, who are elected by the people, and those cities remain in the same condition as those in Europe, and the smoke nuisance remains unabated. We would suggest to the Society for the Promotion of Atmospheric Purity that they take the matter up and proceed against the offenders in the same manner that the Humane Society enforces the laws relative to cruelty to animals. This has been done successfully in most of the cities of the United States; and if the laws were enforced and an honest and intelligent effort made to abate the smoke nuisance there is no doubt that it could be accomplished, and that, too, without any hardship to the steam users and to those who are making the nuisance, to bring about the results so much desired. It is only necessary that the furnaces burning bituminous coal should be so constructed that the combustion shall be made complete; and the nearer we go to complete combustion in the furnace the less coal it takes to make steam.

THE MICHIGAN STATE BOARD OF HEALTH.

All the members of the State Board of Health were present at the regular meeting July 14, 1891, and some important work was done. The most important action was directing the Secretary to publish a brief pamphlet on the restriction and prevention of consumption, the pamphlet having been adopted by the Board after very careful consideration. This pamphlet states that consumption is the most common and fatal disease, "that the number of deaths which actually occur in Michigan from consumption is probably over twenty-five hundred per year;" that "consumption is now known to be a communicable disease," and that "a large part of this mortality can and ought to be prevented." The pamphlet describes the bacillus which causes consumption and which is in the sputa of consumptives, and cites instances where consumption has been communicated by the sputum dust containing these germs, and emphasizes the importance of destroying the sputa of consumptives.

The pamphlets on the restriction and prevention of the other most dangerous communicable diseases were ordered reprinted for distribution among the neighbors of those sick.

A proposed pamphlet on the "restriction and prevention of measles," was thoroughly discussed by paragraphs, amended, and the Secretary was directed to print and distribute the document as amended, for instruction in the restriction and prevention of this disease, which the Board declares is a disease "dangerous to the public health," and which should be dealt with according to the laws in Michigan.

The age at which most deaths occur from measles is that between one and two years. This is the age of greatest danger, and all should take especial care to guard children at that age.

The following resolutions were adopted:

Whereas, This being the first meeting since the termination of the services of Drs. Lyster and Kellogg, as members of the State Board of Health, it is an appropriate time to place upon record our high appreciation of the value of their services; therefore,

Resolved, That the eighteen years gratuitous services of Henry F. Lyster, A. M., M. D., as a member of the Michigan State Board of Health, entitle him to the gratitude of the people of Michigan; that through his labors on the Board and its committees, especially the Committee on "Epidemic, endemic and contagious diseases," his voice and pen have done excellent service in molding and sustaining that part of the public health work of the state, which relates to the restriction and prevention of those important diseased; that we do not forget that although the Bill which he drew was not the one which became the Act establishing that Board, it was largely in consequence of his efforts, as a special committee, that the present effective Board of Health for the city of Detroit was established by the Legislature, in 1881; that in connection with the Sanitary Conventions under the auspices of this Board, his numerous papers read, impromtu discussions, and public addresses on the sanitary drainage of land, sewerage and house drainage in cities, the use of alcoholic liquors, and other topics, have done much toward the formation of public opinion on many sanitary subjects.

Resolved, That the Secretary of this Board be directed to transmit a copy of these resolutions to Mrs. Lyster, and to express the hope of the members of this Board that Dr. Lyster may return from his present trip in Europe in good health, and may long continue, as we have known him to be—the philanthropic physician and sanitarian.

Resolved, That the vigorous sanitary work of Dr. John H. Kellogg, during the twelve and a half years that he has been a member of the Michigan State Board of Health, is work of which any man might well be proud, and all the more because a considerable proportion of it has been done in committee and otherwise under such circumstances that general public recognition of it was impossible, work which has led to the improvement of the ventilation and sanitary condition of many public and private buildings, and has conduced to the general up-building of sanitary progress throughout the state. Dr. Kellogg's experience in the planning, construction, and use of buildings for many inmates, and his conference with architects and others concerned in the planning and construction of building for the various State Institutions whose plans have come before this Board for examination and report, have made him especially useful to the state in the examination of plans for public buildings, his advice on the subjects has been especially valuable. His public addresses and discussions at the sanitary conventions throughout the state are well known. The people of Michigan are richer in money, health, and life, because of the faithful gratuitous labors of Dr. John H. Kellogg as a member of this State Board of Health.

PRACTICAL ESSENTIALS OF THE HEALTHY HOME.

The home, says the Canada Health *Journal*, is where nearly everybody spends the greater part of his or her life. Health depending on the surroundings of one's life as well as on the personal habits, it is absolutely essential to health that the home be in every respect in a good sanitary condition. The first thoughts with those about to build appears to be, in respect to the dwelling, that it shall be "warm" and present a nice appearance; whereas the first thoughts should be that it shall be promotive of and not injurious to the health.

The first essentials for consideration in the construction of a healthy dwelling are, that it shall be free from any excess of dampness, and that it shall admit abundance of fresh, pure air and sunlight.

In order to effectually prevent dampness, nearly every locality and soil requires to be well underdrained before a dwelling is built upon it, and to have a damp-proof course or layer of the best water-proof cement extending to the entire limits of the foundation and up to a little above the surface of the ground, in order that the warmth of the inside of the dwelling in the cold weather shall not draw moisture into it from the soil below and around the lower part of the foundation. The underdrains should be considerably below any cellar or basement floor, and the cement layer laid thickly on a foundation of broken stone, or some good substitute, over all the surface of the floor inside the foundation walls; it may then be laid upon the insides of the walls up to a point a few inches above the surface of the ground, and then, as it were, through the walls to the outside;—this last being done during the building of the foundation walls when these have reached about this point above the ground. Unless the precaution be taken of laying a moisture-proof course upon the inside, and through to the outside of the wall, moisture will come from the ground rapidly through and up the walls, following the courses of the ordinary mortar, to the upper walls and so to the warm rooms.

The first essential in a fresh air supply is provision for withdrawing the breathed, deoxygenated air of all occupied rooms, none of which should be less in size, even for one person to occupy, than about 1,000 cubic feet. With this view, unless there be a constant grate or open fire, there should be an opening from the room into a warmed chimney flue or even stove-pipe. If the outsides of all chimneys, above the roof, were painted black, the heat of the sun thus absorbed by the black surface would greatly aid, winter and summer, in keeping an upward and outward flow of the used-up air of the rooms communicating with the chimneys.

Ordinary windows should never be depended upon for a fresh air supply. When open they give rise to too strong drafts. There should be special fresh air inlets, or at least provision should be made at the window openings for turning the incoming air at once up toward the ceiling. Never occupy a room for a day or a night where there is not some provision for a good supply to your lungs of fresh outdoor air. The construction and occupancy of a close room warmed by coils of steam or hot-water pipes without provision for constant change of the air in the rooms is little short of murder or suicide. The best method of warming a dwelling, as conceded by all authorities, is by means of air constantly flowing into the rooms which has been warmed by means of coils of hot-water pipes attached to and near a furnace, usually in the basement, instead of the coils being placed in the rooms, with provision for a constant withdrawal from the rooms of this warmed air after it has been breathed and has received exhalations from the body and other impurities. Remember, always, it is better to pay for a little extra fuel to warm the cold fresh air than to breathe the foul air of a room over and over again and pay for doctoring and medicine.

Dust in rooms, as dust usually consists of particles of the vilest sort of dirt, is a constant cause of lung and bronchial disturbance and catarrhal symptoms, and all rooms should be so constructed as not to be retentive of dust. Sanitary flooring is now made with joints glued together so that it cannot form dust receptacles. All finishings and furnishings should be so constructed that dust settling on them may be easily reached and taken off with a damp duster, that the rooms may thus be kept as free from dust as possible. With this view all carpets, curtains, etc., must be so arranged that they can be frequently carried out of doors and well shaken.

Use abundance of window glass to let in sunlight. Not only is the light a great destroyer of disease germs, and, too, a direct promoter of health, but with it all dirt can be seen and easily removed.

THE USE OF GAS FOR VENTILATION.

Writing under the above head in a recent issue of the London *Journal of Gas Lighting, Water Supply, &c.*, Mr. Thomas Fletcher says:

"As in many other applications of coal gas as a fuel, its use for the purpose of ventilation has been up to the present, without any system or knowledge of the proper conditions necessary; and I have, for this reason, undertaken a series of experiments with the object of determining the laws which rule its application. An examination of the table given below will show some curious and unexpected facts.

"It is, of course, well-known that for ventilation, or for heating a body of air, the available duty of a luminous or an atmospheric burner is precisely the same; and the choice is purely a matter of convenience and suitability for the conditions necessary. First of all we must consider the fact that burners for this purpose are generally placed in a position where they are difficult or inconvenient to get at and examine; and they are liable to be left for years without any attention. They are also subjected to strong, vertical currents; and, when not required, must be capable of being turned down, with a bye-pass, to a small pilot light, to prevent the necessity of relighting. All these conditions point to the desirability of using small ordinary union jets; and the table shows that the quantity of gas required for any ventilatings haft is remarkably small. When this quantity is exceeded, the duty obtained from the excess is so little that under ordinary circumstances, the extra gas may be considered almost as wasted.

"There is one source of error in the experiments which I have found it impossible to entirely eliminate—the fact that I have been unable to obtain a portable and convenient meter which accurately indicates fractions of cubic feet; and the attempt to correct this by long runs has made the experiments most tedious, lasting over a long period. The meter used registered, on an average 1 per cent. fast; but all the other instruments were absolutely correct. The anemometer was verified, and the correction tables were used; the chronograph was perfect, and the thermometer was recently verified for the purpose. To prevent any doubt as to the choice of burners, the experiments were repeated under exact conditions alternately with a gauze atmospheric burner, and with a flat flame—both burners being used under pressures varying from two tenths to ten tenths; and the results with which each form of burner, under all pressures, were absolutely identical.

Vertical Flue, 6 inches diameter, 12 feet high.

Gas Burnt per Hour.	Speed of Current per Minute.	Total Air Exhausted per hour.	Air Exhausted per Cubic foot of Gas Burnt.	Temperature at outlet. Normal 62o Fahr.
Cubit Feet.	Feet.	Cubic Feet.	Cubic Feet.	
1	205	2,460	2,460	82o
2	245	2,940	1,470	92o
4	325	3,900	975	110o
8	415	4,980	622	137o

With precisely the same arrangements, but with the flue cut down to 6 feet in height, the available duty was reduced 20 per cent.

"Taking the experiments as a whole, it will be seen that in a flue 6 inches in diameter, the maximum speed of current which can be obtained with economy is about 200 feet per minute; and this was realized with a gas consumption of 1 cubic foot per hour —1 cubic foot of gas removing 2,460 cubic feet of air. To double the speed of the current it was necessary to burn 8 feet of gas per hour—eight times the quantity; and the effective duty per cubic foot of gas burnt dropped one-fourth.

"It is a very common thing to see a ventilating shaft, 6 inches or less in diameter, with burners under it consuming from 15 to 20 cubic feet of gas per hour; and it is quite evident that the greater part of this is completely wasted—in fact, in many cases it is worse than wasted, as the extra heat evolved is often very objectionable when radiated from the flames and the external surface of the shaft. The heat escaping at the top of the flue varied from the equivalent of 49,200 cubic feet heated 1° Fahr. to 373,500 cubic feet heated to the same extent; the amount of heat escaping increasing in regular proportion to the increase in the gas consumption.

"These experiments establish the following important facts: That the maximum consumption of gas in a ventilating flue should not exceed 5 cubic feet per hour for each circular foot area of section; that the effective duty of atmospheric and illuminating flames is the same in all cases where a large quantity of air has to be heated to a low temperature; and that the consumption of 1 cubic foot of gas in a ventilating shaft can be made to remove more than 2,400 times its own bulk."

REVIEWS AND NOTES.

We are in receipt of the Eleventh Annual Report of the American Water Works Association, containing proceedings of meeting at Philadelphia, April 14, 15 and 16, 1891. The report shows a large number of members present from all parts of the country, and contains several addresses of much value and interest. The volume is composed of over 200 pages neatly bound. It will be found to possess special interest to those interested in water works, and can be read by anyone with profit.

Hewlings' Directory of Steam Specialties and Engineering Appliances for 1891, has been issued by A. J. Hewlings, publisher, 218 Lake street, Chicago. The book is what its name implies, a directory of all the manufacturers of specialties under their respective headings. The book contains 242 pages and its arrangement is most convenient. An extensive index is supplied by means of which any item can be readily found. How correct or exhaustive the work is we have no means of knowing, but it seems to be as complete as the difficult nature of the undertaking would permit. We have already tested its worth and find it to be very valuable and in every instant so far, correct. It is a convenience we would not be without where possible to obtain. It is substantially bound in cloth and sells for one dollar.

We have from Henry C. Weeden, 84 North and 16 North Centre streets, Boston, a handsome catalogue of Weeden's Charmante lavatories. In the work different patterns and sizes of the lavatories are illustrated with accompanying descriptions. Any one ordering from this catalogue can feel certain that he will receive what he orders, for everything is so plain that no mistake can be made. The specimens are beautiful and adapted to the tastes of all. Weeden's scientific safety basin is also presented in the catalogue. It is a recent patent, and the construction of the

basin is to prevent overflow. The overflow pipe has the outlet at the bottom of the basin; it is brought up near the top and turned back and brought below the plug to waste. This forms a syphon through the action of which the basin is emptied and overflow rendered impossible.

We are pleased to receive from the Engineers' Club of Philadelphia Vol. VIII., No. I, of the club's proceedings. We have on previous occasions called attention to this publication and to the merits it possesses. The rate of subscription has been reduced to $2 per volume consisting of four numbers. The publication is well worth its price and will surely gain a wide circulation among those interested. It is attractively printed and bound and its reading matter is of a high grade and valuable.

PLUMBING NOTES.

Do not make a guess as to what a job of plumbing will cost but calculate it exactly. Knowing what it will cost will enable one to do the work without losing money.

William Halley of Columbus, O., has been awarded the contract for plumbing the west side engine house in that city.

The Kansas City *Star* of July 24, says: In a suit for $60, plumbing brought by the Goss Heating and Plumbing Company against C. T. Snow, Justice of the Peace Allen is presented a nice point for decision. Snow refused to pay the bill because the Goss Company belonged to the Plumbers' Association of this city, which, he alleges, has formed a combination to keep up prices. Snow rests his case on the Missouri pool and trust law which provides that a contract with a company or firm that belongs to a combination to govern prices is not valid. The case was heard Tuesday. Goss acknowledged that the Plumbers' Association has a schedule of prices, but denied that he had observed this schedule. Among the witnesses for Snow were A. A. Nichol & Company, who have a $50,000 damage suit pending in the circuit court now in which they allege a conspiracy on the part of the Association to ruin their business.

Through the kindness of Mr. J. T. Holmes, Secretary of the St. Paul Master Plumbers' Association, we are enabled to publish the following list of officers of that Association for the ensuing year: President, J. H. Shea; Vice-president, P. Gleich; Secretary, J. T. Holmes; Treasurer, P. W. Hudner. Board of Directors, W. J. Freaney, J. T. Holmes, P. V. Dwyer. Mr. Holmes states that the Association is in a prosperous condition and its affairs were never in better shape than at present.

The journeymen plumbers of Boston recently asked for an increase from $3.50 to $4 a day with the understanding that unless the increase was forthcoming they would strike. At a meeting of the Master Plumbers' Association it was unanimously voted not to grant the increase. A meeting of the journeymen was called for and a strike will probably result.

Commencing August 15, sanitary, factory, tenement, smoke, and meat inspectors will wear a uniform consisting of a blue blouse with black buttons, waistcoat and blue trousers. A broad binding of mohair braid will adorn the suit. The waistcoat will be collarless and high cut, with police buttons. A red Greek cross will ornament each lapel of the coat.

The London, Ont., plumbers have asked for nine hours and $2.25 per day.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED, LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND BUSINESS ADDRESS. PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Aberdeen near 58th street, J. J. Doyle, 6040 So. Halsted street.
5724 Aberdeen street, J. J. Doyle, 6040 So. Halsted street.
Ada and 42d street, D. Walsh, 6758 So. Chicago ave.
5415 Atlantic street, P. Schmidt, 4928 State street.
670 Austin ave., Bowman Bros., 678 W. Chicago ave.
598 Ashland ave., P. J. Morrissy, 417 So. May street.
43 Adelaide street, P. Feltman, 1149 Lincoln ave.
Atlantic near 52d street, D. Jack, 882 W. Lake street.
3323 Archer ave., J. Curtin, 4929 So. Ashland ave.
1216 Belmont ave., Wm. Bletch, 930 Sheffield ave.
174 Belmont ave., Pitts & Son, 93 Gardner street.
298 Belmont ave., Pitts & Son, 93 Gardner street.
Bryant ave., near 50th street, T. Gray, 72 31st street.
70 Brigham street, C. Breyer, 833 Milwaukee ave.
39 Chicago ave., E. Sheehan, 222 Illinois street.
98 Commercial ave., Webster, Crombie & Henderson, 9243 Commercial ave.
291 Cleveland ave., Pitts & Son, 93 Gardner street.
208 Clark street, G. A. Fehr, 80 Canalport ave.
427 Cleveland ave., Fred Neustadt, 300 North ave.
Clybourn pl. east of Robey street, H. Breyer, 1706 Milwaukee avenue.
246 Cortland street, H. Breyer, 1706 Milwaukee ave.
296 and 298 Cortland street, G. B. Kemp, 899 W. North ave.
Cuyler street near Hoyne ave., Molter & Kretchmer, 426 E. Division street.
15 Clark street, C. F. Klentz, 552 Elston ave.
4313 Cottage Grove ave., Sims & Son, 588 W. Madison street.
344 Cortland street, Harvy & Mose, 665 North ave.
Champlain ave. bet. Seventy-fourth and Seventy-fifth streets, F. Fischer, 7446 Cottage Grove ave.
Drexel boule. and Sixty-third street, David Walsh, 6758 S. Chicago ave.
Dearborn street and Cloud Court, P. Schmidt, 4928 State street.
286 Dayton street, F. Neustadt, 300 North ave.
5637 Dearborn street, A. C. Pagel, 6746 Yale street.
396 Dudley street, C. Breyer, 833 Milwaukee ave.
406 Duncan Park, Robt. O'Donnell, 960 Spaulding ave.
861 and 813 David ave., Harvy & Mose, 665 North ave
Drexel boule. south of Forty-third street, E. Baggot & Son, 2135 Michigan ave.
Drexel boule. near Sixty-sixth street, F. J. Fischer, 7446 Cottage Grove ave.
Erie street between Robey and Hoyne ave., C. J. Brooks Plumbing Co., 879 W. Polk street.
163 W. Eighteenth street, W. Daniels, 406 Western ave.
1809 Elston ave., Bayha & Bachman, 124 Clybourn ave.
575 Eighteenth street, C. Uher, 524 W. Eighteenth street.
1648 Fletcher street, Alles & Bro., 227 Lincoln ave.
Franklin street near Hoffman, E. Breyer, 72 W. Randolph street.
1185 Fulton street, P. C. Desmond, 906 W. Lake street.
Fiftieth street and Ellis ave., J. J. Wade & Son, 112 Dearborn street.
Francisco ave. near Jackson street, D. Jack, 882 W. Lake street
90 Fowler street, C. Breyer, 833 Milwaukee ave.
Forty-seventh street east of state, E. Hennessy, 3247 State street.
7310 Green street, J. J. Doyle, 6040 S. Halsted street.
Greenwood ave. and Seventy-seventh street, D. Walsh, 6758 S. Chicago ave.
4224 Grand boule., Markey & Co., 2918 Cottage Grove ave.
Grand boule. and Forty-first street, E. Hennessy, 3247 State st.
896 Hinman ave., Steiner & McFarlane, 918 W. Twenty-first st.
Harrison street west of Kedzie ave., E. Sheehan, 222 Illinois st.
605 Holt ave., C. F. Kleutz, 552 Elston ave.
150 Hoffman ave., H. Breyer, 1706 Wilwaukee ave.
640 Holt ave., H. Breyer, 1706 Milwaukee ave.
541 Halsted street, Jno. K. Moran, 1620 Wabash ave.
165 Humboldt ave., J. Burns.
609 Harrison street, Geo. Miller, 1138 W. Lake street.
Halsted and Fifty-ninth street, Morris & Bro., 3442 S. Halsted st.
6616 Honore street, Dewar & Co., 6312 Wentworth ave.
Harvard and Webster streets, Dewar & Co., 6312 Wentworth ave.
374-376 Huron street, C. Breyer, 833 Milwaukee ave.
3113 Halsted street, J. J. Quinn, 2543 S. Halsted street.
752 Herndon ave., J. J. Quinn, 2543 S. Halsted street.
249-259 Indiana street, J. O'Brien, 293 W. Indiana street.
659 Jane street, Nelson & Cederholm, 87 W. Ohio street.
734 Jane street, C. Breyer, 833 Milwaukee ave.
Jefferson street near Austin ave., E. Baggot, 171 Adams street.
Kenmore near Claremont ave., W. Bletsch, 930 Sheffield ave.
Langley ave. and Sixty-sixth st., D. Walsh, 6758 S. Chicago ave.
3628 La Salle street, E. D. Connor, 2464 Archer ave.
1228 Lexington ave., W. Daniels, 406 Western ave.
2931 Lowe ave., L. Herzog, 2230 Archer ave.
Lake near Fortieth street, H. Breyer, 1706 Wilwaukee ave.
Linden ave. near Logan street, H. Breyer, 1706 Milwaukee ave.

252 Larrabee street, C. Redieske, 99 Clybourn ave.
171-177 Moore ave., Nash & Hama, 2216 Wabash ave.
5330 May street, J. J. Doyle, 6040 S. Halsted street.
293 Monroe street, J. J. Hamblin Plbg. Co., 348 S. Robey street.
Monroe ave. near Fifty-fifth street, J. J. Clark, 119 E. Twenty-second street.
Marshfield ave. near Thirty-sixth street, C. Kostlevy, 218 W. Eighteenth street.
1218 Montana street, Fred Neustadt, 300 North ave.
1163 Maplewood ave., H. Breyer, 1706 Milwaukee ave.
Michigan ave. and Forty-fifth street, Mandable & Deveny, 2306 Cottage Grove ave.
Marshfield ave. near Thirty-sixth street, C. Kostlevy, 218 W. Eighteenth street.
80 Mohawk street, C. Redieske, 99 Clybourn ave.
39 and 41 Menominee street, C. Redieske, 99 Clybourn ave.
1236 Madison street, D. Jack, 882 W. Lake street.
Morgan street near Sixty-seventh, J. Bain, 6338 Justine ave.
1713 Melrose ave., H. W. Harker & Co., 550 Lincoln ave.
349 Monroe street, J. Breen, 373 W. Van Buren street.
Matteson st. near Winter, F. Fischer, 7446 Cottage Grove ave.
North ave. and Wieland street, F. Neustadt, 300 North ave.
Oakdale ave. east of Clark street, F. Neustadt, 300 North ave.
116 O'Brien street, C. Kostlevy, 218 W. Eighteenth street.
381 Ohio street, F. Falk, 717 Milwaukee ave.
60 Powell ave., Nelson & Cederholm, 87 W. Ohio street.
274 Paulina street, Nelson & Cederholm, 87 W. Ohio street.
421 Perry ave., Nelson & Cederholm, 87 W. Ohio street.
2743 Portland ave., E. D. Connor, 2464 Archer ave.
3239 Parnell ave., P. K. Hardin, 3521 State street.
Park ave., Normal Park, A. C. Pagel, 6746 Yale street.
280-284 Park ave., P. C. Desmond, 906 W. Lake.
Park near Belmont ave., H. Bauer, 232 E. North ave.
1634-36 and 1729 Prairie ave., E. Baggot, 171 Adams street.
885 Racine ave., Nelson & Cederholm, 87 W. Ohio street.
709 Root street, E. D. Connor, 2464 Archer ave.
1120-24 Robey street, C. Kleutz, 552 Elston ave.
208 Richmond street, W. A. Anthauer, 538 Milwaukee ave.
957 Rebecca street, C. Uher, 524 W. Eighteenth street.
685-87 Rockwell street, D. Jack, 882 W. Lake street.
Rumsey west of Jane street, C. Breyer, 3833 Milwaukee ave.
40 Sidney Court, Nelson & Cederholm, 87 W. Ohio street.
91 Sangamon street, C. J. Brooks, 879 W. Polk street.
Sangamon street near 59th, J. J. Doyle, 6040 So. Halsted street.
Stewart ave. and Franklin street, Samuel Dietscher, Milwaukee ave., north of Lawrence ave.
W. Superior near W. 50th street, Thomas J. Low, 112 W. 48th street.
4800 School street, P. Schmidt, 4928 State street.
Southport ave. and Nellie street, F. Neustadt, 300 North ave.
75th street near Drexel boul., J. H. Roche, 210 31st street.
Springfield and Ohio streets, H. Breyer, 1706 Milwaukee ave.
Stewart ave. and 73d street, Dewar & Co, 6312 Wentworth ave.
4540 St. Lawrence ave., D. Jack, 882 W. Lake street.
62d street nr. Wentworth ave., Lyon & Lee, 6215 Wentworth ave.
6707-13 Wentworth ave., F. Murphy, 6810 So. Halsted street.
Sacramento ave., north of Lake street, J. Birney, 4001 W. Madison street.
707 Seymour street, Harvy & Mose, 665 North ave.
577 Sawyer ave. J. Breen, 373 W. Van Buren street.
State street near Burton place, E. Baggot, 171 Adams street.
St. Lawrence ave. and 71st street, F. Fischer, 7446 Cottage Grove avenue.
Shell ave. near 74th street, F. Fischer, 7446 Cottage Grove ave.
74th street, F. Fischer, 7446 Cottage Grove ave.
66th street and Maryland, F. Fischer, 7446 Cottage Grove ave.
Selwyn and Montrose aves., J. Doyle, 6040 So. Halsted street.
39th street, east of Parnell ave., M. Kellegher, 3417 Dashiell st.
26th and Pomeroy streets, G. Miller, 1138 W. Lake street.
825 32d street, C. Kostlevy, 218 W. 18th street.
1268 20th street, C. Kostlevy, 218 W. 18th street.
432 26th street, L. Herzog, 2230 Archer ave.
35th street and Lowe ave., J. Curtin, 4929 So. Ashland ave.
22d and Lincoln streets, Steiner & McFarlane, 918 W. 22d street.
12th and Cypress streets, E. Baggot, 171 Adams street.
Vernon ave. and 65th street, D. Walsh, 6758 So. Chicago ave.
2068-70 Vernon ave., J. J. Wade & Son, 112 Dearborn street.
Vincennes ave. and 73d st, Dewar & Co., 6312 Wentworth ave.
579 Washburne ave., J. H. Shannon, 273 Blue Island ave.
530 Wells street, Valentine Rush, 548 Wells street.
Wabash ave. and 48th street, P. Schmidt, 4928 State street.
Wallace and 31st streets, P. Schmidt, 4928 State street.
5615 Winter street, P. Schmidt, 4928 State street.
2943 Wentworth ave., L. Herzog, 2230 Archer ave.
526 Winchester ave., P. Z. Morrissey, 417 So. May street.
361 Washburne ave., Chas. Uher, 524 W. 18th street.
Wellington ave., east of Ashland ave., P. Feltman, 1149 Lincoln avenue.
1518 Wabash ave., Young & Cavanah, 995 W. Madison street.
983 and 988 Washtenaw ave., Harvy & Mose, 665 North ave.
Winter and Matteson streets, C. J. Boyd, 805 47th street.
4540 Wallace street, C. J. Boyd, 805 47th street.
4743 Wabash ave., E. Hennessey, 3247 State street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: H. B. Wheelock has completed plans for the construction of Emanuel Baptist Church, at Michigan avenue and Twenty-third street, which was partly destroyed by fire recently. The interior will be changed and redecorated, while the front will be improved by removing the present high steps and making the entrance on the street level; cost, $30,000. He has also planned a 3-story and basement flat building, 40x70, to be built at 6210-12 Wentworth avenue, by Hollett & Tinsman. Pressed brick and stone construction; cost, $16,000. R. C. Berlin has designed six 2-story and basement flat buildings, 112x56, for W. H. Colvin, Jr., to be built on Forty-seventh court, near Cottage Grove avenue; cost, $28,000. Wilson & Marble have planned a 2-story basement and attic residence, 60x66, for W. R. Condib, to be built on Sheridan drive, Evanston. Stone and brick construction, with elaborate interior arrangements; cost, $25,000. The same architects have designed the reconstruction of Edwin F. Getchell's residence on Prairie avenue, near Twenty-sixth street. For Hon. Clayton E. Crafts they have designed a handsome $7,000 frame residence, to be built at Austin, Ill. J. A. Thain has designed a 3-story apartment house, to be built on Prairie avenue, near Twenty-fourth street, by F. Gorland. It will be constructed of stone, with hardwood interior. Also a 3-story residence, 25x75, to be built on Vincennes avenue. It will be constructed of stone and pressed brick; cost, $12,000. He has also designed the reconstruction of J. H. Curtis' residence, at Oakenwald avenue and Forty-fourth street. Henry Ives Cobb has planned a 3-story rectory for St. Charles' Catholic Church, to be built on Twelfth, near Cypress street. It will be 43x66, of brown stone, with hardwood interior; cost, $30,000. C. S. Frost has planned a 3-story dwelling for Sherbum Sanborn, to be built at 487 North State street. It will be constructed of Roman mottled brick, with hardword interior, and heated by hot water; cost, $15,000. J. J. Egan has planned a 3-story residence for Charles Nitcher, to be built at 4418 Drexel boulevard. It will be built of marble, with hardwood interior and hot water heating apparatus; cost, $60,000. He has also planned a 3-story and basement flat building for John Condrick, to be built on Washington boulevard; cost, $12,000. He has also completed plans for St. Patrick's Roman Catholic Church to be built at Cedar Rapids, Iowa. The exterior will be constructed of rock faced stone, with slate roof and hardwood interior; cost, $30,000. J. A. Wierzbreniec has designed a 3-story and basement store and flat building, 32x93, to be erected on Laurel avenue, near James avenue. Pressed brick and stone construction; cost, $16,000. He has also planned, for M. Rybsky, a 3-story and basement store and flat building, 22x85. Brick and stone construction; cost, $8,000. Fred Baumann and J. C. Cady have planned a 2-story residence for W. V. Griffin, to be built on Forest avenue, Evanston. It will be constructed of timber; cost, $6,000. P. W. Anderson has designed a 3-story and basement flat building, 28x130, to be built at Forty-fifth and Champlain avenue, by A. L. and F. D. Patterson. It will be constructed of pressed brick and stone; cost, $30,000. Also a 4-story and basement store and flat building,

35x100, to be erected at 68 Thirty-first street. The front will be of stone; cost, $30,000. William Greisser has planned a beer depot office and staple for C. Herring & Sons, to be built at Blue Island ave. and Sixteenth street. It will be constructed of pressed brick and stone. For George Walter a 5-story brewery, at Appleton, Wis.; cost, $35,000. W. J. Van Keuren has designed a 2-story residence for Jessie A. Baldwin, to be built at Oak Park. It will be constructed of pressed brick and stone; cost, $10,000. ——New York City, N. Y.: Withers & Dickson have designed for the Commissioners of Charities and Corrections, a pavilion for alcoholic patients, to be erected at Bellevue. L. J. O'Connor has plans for alterations to be made in the Cathedral parish school building, in Fiftieth street. The entire building will be raised one story in brick and stone, with fireproof furring and slate steps. $17,000 will be spent on the improvements. Thomas F. Cook will erect two 5-story tenement houses, 25x65 each, on the south side of Seventy-ninth street, 150 feet west of Avenue A. John C. Burne is the architect. Thom & Wilson have plans for a 5-story tenement house, 27x87, to be built on One Hundred and Thirty-eighth street, south side, 100 feet east of Lennox avenue, by Patrick Farley. Charles Rentz has plans for two 5-story and basement brick, stone and terra cotta flats, 24.6x77, to be built at 196-98 Orchard street for Mrs. E. Hartsfelder; cost, about $35,000. James T. Pyle will build a 12-story factory on a plot covering 22,955 square feet, at 331 West street, southeast corner King street; 132-38 King street; 133-35 Charlton street and 536-40 Washington street. John Hauser has plans for six 5-story brick and brownstone front tenements, 25x77 each, to be built on the north side of Eighty-eighth street, west of Avenue B, by Joseph Schreiner, to cost $90,000 and three similar buildings, two 25x65 each, and one 16x65, to be built on the north side of King street west of Congress, by Michael McCormick and Henry Madden, at a cost of $50,000. ——Philadelphia, Pa.: Over 100 handsome dwelling houses will soon be erected at the southeast corner 13th and Dauphin streets by E. P. Hipple, the builder. They will be three stories high, with pressed brick fronts trimmed with carved brownstone. Architects Furness, Evans & Co. have designed a new recitation hall, to be erected at Delaware College, Del. The contract for the erection of a large mill at 23d and Ritner streets, for Clark, Thomas & Co. will be awarded within a week by Architect John T. Windrim. The plans have been modified considerably. The National Bank of Atlantic City will erect a new office building after plans prepared by Frank R. Watson. It is said that the Knights of the Golden Eagle will build a new hall at a cost of $50,000. Architects Geissinger & Hales have completed the plans for a mill to be built at 28th and Parrish streets by Powell Brothers. An operation involving over $250,000 will soon be started by Jacob R. Jordan on the south side of Lancaster avenue, west of 32d street. Thirty-three large houses will occupy the site. Twenty-three dwelling-houses will be erected on the south side of Somerville street west of 26th, by John B. Carey. A. J. Stewart, the contractor, will build a 5-story factory building, 60x202, on the west side of Beach street, north of Poplar, for the Shimmel Preserving Company. A handsome house will be erected at Chestnut Hill for John S. Jenks during the next few months. Ground has been broken at the southwest corner of 11th and Spruce streets for a 5-story apartment house, 23x200. C. F. Wells & Son, builders, have been awarded the contract. A four-story factory, 51x162, will be built on the west side of Pennock street, north of Parrish, by John M. Anderson.——Baltimore, Md.: The members of the African Church contemplate building a chapel. It is stated that D. M. Newbold will erect a number of modern dwellings. A building permit has been granted to Emanuel Ellinger & Bro. for the erection of twenty-eight 2-story brick buildings. The Canton Congregational Church will erect an edifice 64x100. The members of the Henshaw Memorial Protestant Episcopal Church will build an addition to their edifice. The Hannis Distilling Co. will erect a 4-story brick warehouse on Ostend street. ——Cincinnati, Ohio: Architects S. Hannaford & Sons have plans for a hotel or flats to be erected at Walnut Hills for Fred Alms, Main and Canal streets; cost, $100,000. Architect M. Rumbaugh has designed for the Methodist Episcopal Church (South), Ashland, Ky., a church edifice; cost, $20,000. Architects G. &. A. Brink have designed a 4-story press brick store and flats for M. Goldsmith. To be located on Vine, near 15th street; cost, $10,000. Architect Chas. Diss has plans for a residence to be erected at Winton place, for Herman Dorman. To be 2½ stories, built of brick with stone trimmings; cost, $8,000. Architect P. Pfeiffer has plans for a dwelling for Fred Hauser, Massachusetts avenue, near Rachel street. To be three stories, built of brick with stone trimmings; cost, $5,000. Architects Crapsey & Brown have designed for the Methodist Episcopal Church (South), Maysville, Ky., a church edifice; cost, $20,000. Architects Rieg & Marty have plans for two dwellings for F. R. Davis, Pomeroy, O. To be 2½ stories; cost, $10,000. Architect Wm. C. Lawrence has designed two single 2½-story brick dwellings for Wm. Jeyns. To be erected at Glendora and Nixon streets, Corryville; cost, $7,000. ——Pittsburg, Penn.: Architects Hodgdon & Thomas have prepared plans for a residence for Mrs. R. W. Patterson, on Howe street, East End. Material, pressed brick, stone trimming, three stories; cost, about $18,000. The same architects have completed plans for the Henry Auction Company's new quarters, on 9th street, below Penn avenue. They have also made plans for a brick house at Rankin station, P. R. R., for Mr. Joshua Pearce. Capt. J. J. Vandergrift will erect on the corner of Wood and Water streets, next year, a 6-story business edifice. Architects Messrs. Longfellow, Alden & Harlow are preparing the plans. Architects Alston & Heckert have plans for a building for Mr. W. S. Guffey on Liberty avenue, two stories and finished attic, pressed brick; contractors, John Trimble & Bros. Chauncey Hodgdon has plans for five brick houses, to be erected for Mr. N. J. Black, on Duff street and Wylie and Webster avenues. Architect J. E. Obitz has plans for a store-room and dwelling for John S. Sell at Greensburg, Pa., frame, 40x96, two stories. Also plans for a store-room and dwelling, 2-story brick, 26x68, for Mr. S. Lyons, at Butler, Pa. Also plans for a brick residence of twelve rooms, for Mr. Reymer, at Greensburg, Pa. The same architect has prepared plans for a residence on Center avenue, near Roup, for Mr. W. F. Gardner, brick, 2-story and finished attic. Col. Stone will erect from ten to fifteen houses at Clifton place, near the terminus of the Pleasant Valley R.R.; brick dwellings, designed by Hodgdon & Thomas.——Washington, D. C.: Colonel George L. Andrews, of the Army, will build a spacious house on Washington Heights, at the corner of Columbia road and Mintwood place, from plans now being prepared by Architect T. F. Schneider. Dr. J. M. Sterrett is having plans prepared by Architect James G. Hill for a residence that he will have built near Tennallytown, D. C. It will be 49x49, two stories, cellar and attic high, and will be constructed entirely of Potomac blue stone; cost, $25,000. Frank N. Hobbs, the builder, has contracted to erect a 3-story and basement brick dwelling at 2106 R street, northwest, for H. L. Rust, from plans drawn by Architect James F. Denson; cost, $8,000. Architect R. G. Crump has drawn the plans for a residence which Builder Frank N. Carver will erect for E. G. Davis on Kalorama Heights; cost, $11,000. The three buildings on the east side of Twelfth street, just below the corner of F, have been demolished, leaving a space 80x100, upon which the new Metzerott Hall will be erected. The work on the foundation will begin at once. The contract for the construction is let to Mr. Plager.——Little Rock, Ark.: Architects Rikon & Thompson have prepared plans for a school building, to be erected at Searcy, Ark. To be 60x80, two stories, built of common brick, with stone foundation; cost, $7,500 to $8,000.——Arkansas City, Ark.: The Water-Pierce Oil Co. contemplates erecting a warehouse.——Batesville, Ark.: Architect C. T. Rounthall has prepared plans for a bank building, to be erected on Main street, for the People's Savings Bank. To be 22x60, one story, built of common and enameled brick and terra cotta.——Denver, Colo.: Architect James Murdock has plans for a 70-room hotel, to be erected on Seventeenth and Ogden avenue. To be 145x142, three stories, built of common brick; cost, $60,000.

HEATING AND LIGHTING.

New electric light plants or extensions of those already existing are reported as probable in the following places: Ellicott City, Md.; Leroy, Fla.; East Aurora, N. Y.; Peoria, Ill., address the Jenny Electric Light & Power Co.; Pass Christian, Miss., address Shaffer Bros.; Baltimore, Md., address J. Pope; Bellows Falls, Vt.; Dallas, Tex.; Flemingsburg, Ky., address the Flemingsburg Electric Light Co.; Corpus Christi, Tex.; Galion, O.; Schoolcraft, Mich., address P. D. Miller; Edinburg, Ind.; Crown Point,

Ind.; Cambria, Wis.; Port Republic, N. J.; Marion, Ill.; Gallipolis, O.——Spencer, Mass.: The residents are discussing the installation of a municipal gas and electric lighting plant.——High Point, N. C.: E. A. Snow and J. E. Cox have been appointed by the City Council to act as a committee to buy a plant of about 50 arc lights capacity.——Charleston, S. C.: The Charleston Light & Power Co. will receive proposals for the construction of the foundations and buildings of its new station.——Kansas City, Kan.: The recently incorporated Merchants' Electric Light Co. proposes to erect a plant with a capacity of 100 arc and 500 to 600 incandescent lamps.——The following electric light companies have been recently incorporated: Eureka Electric Co., Chicago, Ill.; capital stock, $10,000; incorporators, L. K. Curlett, C. W. Fletcher, C. F. Gooding. Merchant's Electric Light Co., Kansas City, Kan.; capital stock, $50,000; incorporators, C. Hoffman, H. Ettenson, H. Bruns, Illinois Electric Welding & Mfg. Co., Chicago, Ill.; capital stock, $20,000; incorporators, P. Harvey, J. W. McGeah, R. L. North, Jr. Beatrice (Neb.) Light & Power Co.; capital stock, $250,000; incorporators, E. P. and F. J. Maxwell, W. Pickrell and others. San Antonio Light & Power Co., Los Angeles, Cal.; capital stock, $240,000; incorporators, T. K. Bard, of Hueneme; N. W. Blanchard, of Santa Paula; J. A. Dale, of Pomona and others. Edison Light & Power Co., San Francisco, Cal.; capital stock, $3,000,000; directors, F. F. Upton, J. D. Green, Gustav Sutro and others. West Arlington Telegraph, Telephone, Electric Light Co., West Arlington, Md.; incorporators, George R. Webb, Oscar C. Martenet and others.

SEWERAGE NOTES.

Cambridge, Mass.: The Committee on Sewers has been authorized to ask bids for 500,000 sewer brick to be delivered within a year.——Clinton, Mass.: $10,000 will be spent in sewer construction.——Marlboro, Mass.: Sewerage bonds to the amount of $100,000 will be issued.——Palmer, Mass.: J. J. Vanvalkenburg has completed plans for sewers.——Watertown, Mass.: The Sewer Committee, H. H. Sawyer, Chairman, has been authorized to contract for sewers, and $100,000 in bonds have been voted. ——Pawtucket, R. I.: Sewers will be laid in many additional streets——Greenwich, N. Y.: Plans for a system have been made by the Troy Engineering Co.——Lansingburgh, N. Y.: An election will be held on the building of sewers in several streets at a cost of $70,000.——Sandy Hill, N. Y.: Plans for a system have been made by Smith Reeves of Troy.——Knoxville, Tenn.: The sum of $500,000 has been voted for sewers.——Columbus, Ohio: The Council has appropriated $250,000 for sewers.——Haselton, Ohio: A sewerage system will be built.——Ypsilanti, Mich.: A sewerage system is under consideration.——Des Moines, Ia.: Sewers will be put in North Des Moines, Capital Park and University Place.——Topeka, Kans.: Additional sewers will be laid at a cost of $90,000.——Grand Forks, N. D.: Bids for a sewerage system planned by Chester B. Davis of Chicago, will soon be asked.—— St. Louis, Mo.: Many additional sewers will soon be laid.—— Sansalito, Cal.: A system is projected by the Improvement Association.——Santa Monica, Cal.: Sewers are projected.—— Decatur, Ill.: The Public Improvement Committee has authorized numerous sewer extensions. City Attorney McDonald can furnish particulars.

WATER WORKS NOTES.

Madison, Wis.: Works are projected.——Concord, N. H.: Plans for the proposed works have been adopted by the water commissioners and include a pumping station, reservoir with a capacity of 2,000,000 gallons or more, a 20-inch force main and a 14 and 12-inch supply main.——Brooklyn, N. Y.: The aldermen have authorized the issuance of $150,000 of water main extension bonds and the expenditure of $25,000 for allowing the Ridgewood reservoir.——Clyde, N. Y.——It is reported that a new filter will be added.——Dryden, N. Y.: It is proposed to put in works.—— Edwards, N. Y.: There is talk of putting in a water-works system. ——Hancock, N. Y.: Improvements are to be made in the present system.——Lancaster, N. Y.: The subject of works is under consideration.——Lawrence, N. Y.: The Lawrence Water Co. has projected works to cost about $8,000. A main 1½ miles in length would be sufficient to extend from the source of supply to and through the village. ——Lowville, N. Y.: A gravity supply from a point about 2½ miles distant is projected; estimated cost, $65,000. ——Oxford, N. C.: Works are again projected.——Barnesville, Ga.: Address J. J. Rogers regarding proposed works.——Cedartown, Ga.: It is reported that two 1,000,000-gallon pumps and a 16x80 stand-pipe will be wanted by the city. Address A. Richardson.——Macon, Ga.: A bill has been proposed for presentation to the legislature authorizing the city to issue $412,000 of bonds for works.——Wrightsville, Ga.: Works will be built.——Columbia, Ala.: A contract for works may be let in September. The city has authority to issue bonds but may grant a franchise.—— Dothen, Ala.: Bonds for works have been voted.——Uniontown, Ala.: Contracts for works will be let as soon as $25,000 of bonds have been sold.——Wapakontea, Ohio.: The people have voted for works. It is undecided whether the city shall build works or grant a franchise.——Nappanee, Ind.: The contract for building works will be let about August 20. Estimated cost, $10,000 to $12,000.——Dwight, Ill.: Works will be built at a cost of $20,000.—— Peru, Ill.: The Peru Water Works Co. has been incorporated by Wm. Holly and others with a capital stock of $20,000.——Estherville, Ia.: A franchise previously granted was not accepted and is now open to others. The franchise is exclusive for 20 years and provides for not less than 1½ miles of mains and ten hydrants, the latter at an annual rental of $60 each. Exemption from taxation for seven years is granted.——Winnebago City, Minn.: The city expects to let contracts soon for works to cost about $10,000.—— Chadon, Neb.: Bonds to the amount of $20,000 have been voted to lay 4 miles of mains.——Butte, Mont.: The council has voted to ask for bids for supplying water for five years.——Brunswick, Mo.: Estimates for constructing works are wanted.——Texarkana, Ark.: Works with a supply from artesian wells are projected.—— Belton, Tex.: The Belton Water Co. has been incorporated with a capital of $30,000 by J. Z. Miller Jr. and others.——Comanche, Tex.: The town proposes to build works with a supply from wells, pumping to a stand-pipe. Estimated cost, $30,000.——Tacoma, Wash.: Numerous improvements will be added to the present system of water-works at an estimated cost of $400,000.——Kingsville, Ont.: Works are to be built.

BIDS AND CONTRACTS.

Guthrie, Ok. T.: Contracts for water works to be owned by the city will be let August 15. Address G. W. Taylor, Chief of Fire Department.——Durango, Colo.: Bids will be received until August 4, for furnishing 2,500 feet of 8-inch cast-iron pipe. Address Blair Burwell, City Clerk.——Hallettsville, Tex.: Mayor M. S. Townsend wants bids for furnishing a plant of 300 incandescent lamps, capacity working over a 4-mile circuit, also for a system of 10 arc and 200 incandescent lights on a 2-mile circuit. ——Gainesville, Fla.: Proposals are wanted until August 14, for construction of a complete system of water works. Address A. J. McArthur, Chairman Water Supply Committee.——Elgin, Ill.: Sealed proposals will be received until 12 o'clock, August 4, by the Trustees of the Illinois Northern Hospital for the Insane, for furnishing the material and erecting a stand-pipe of 100,000 gallons capacity on the asylum grounds.——Marion, Ohio: Bids are invited until August 6, for the construction of certain sewers. Address H. F. Snyder, City Clerk.——Springfield, Mo.: Proposals are wanted, no date specified, for the construction of a sewerage system. Address G. W. Hackney, City Clerk.——Findlay, Ohio: Proposals are invited till August 7, for the construction of certain sewers. Address Marion G. Foster, City Clerk.——Grand Forks, N. D.: Proposals are wanted until August 15, for the construction of about 15,000 feet of pipe sewers. Address C. A. Hale, City Auditor.

G. A. R. ENCAMPMENT AT DETROIT.

The Wabash Railroad is now generally recognized as the Grand Army Line. As a matter of principle, it always does everything in its power to favor that organization. Comrades and their friends who purpose attending the coming National Encampment at Detroit, August 3 to 8, should bear in mind that the Wabash is one of the principal lines between Chicago and Detroit, and offers equipment second to none. On August 1, 2 and 3, the Wabash Road will run regular trains from Chicago to Detroit, leaving Dearborn Station, Chicago, at 9:30 A. M., 3 and 10:30 P. M. In addition, such special trains will be run between the hours named as may be necessary to accommodate the public. Rate, one fare for the round trip. Equipment will consist of Palace Sleeping cars, Free Chair cars and Elegant Day Coaches. Send in your names for sleeping car reservations, stating which train you desire to leave on.

THE SANITARY NEWS

IS PUBLISHED EVERY SATURDAY

—AT—

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ADVERTISING RATES.

The advertising rates are reasonable, and will be furnished on application.

"WANT" ADVERTISEMENTS.

Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

REMITTANCES.

Remittances are at the risk of the sender, unless made by check, express order, money order, or registered letter, payable to The Sanitary News.

LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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If Milwaukee carries out her intention of dumping her garbage into the lake, it will not be long till she will regret it. Other cities more favorable situated than Milwaukee is have tried the experiment to their sorrow. There is at present a howl going up from the press of New York City and a portion of its citizens on account of the contents of ash-barrels being dumped into the ocean. According to contract the offal is carried out three miles from shore, but it is carried back to the shore, and decaying vegetable and animal matter strew the beach. Offensive odors arise and one long line of nuisance floats upon the shore waters of our metropolis. Milwaukee will be less fortunate than New York. Her garbage is to be dumped into a comparative small body of water from which water supplies are taken, will probably not be carried so far out, and the winds and choppy seas will soon bring it back slowly to decay along the shore. The dangers of such accumulations are well known. Polluted atmosphere, polluted water and the pollution of everything with which this decaying mass comes in contact, will soon tell the tale of enfeebled energies, disturbed processes of growth and the broad culture grounds of disease. Milwaukee will discover her error when the harm which could have been avoided will become unendurable. The necessities of city life have had and still have too little regard for the purity of water; our streams, rivers and lakes are recklessly polluted, but the day of reckoning is fast approaching, and it will be learned that destruction and not removal will be the solution to the problem of garbage disposal.

Where there is much building done on made ground, as in some parts of Chicago and some other cities, great care should be taken to provide against surface moisture both in the basement and through walls in contact with the earth. Dampness under any circumstances is bad enough and should at all times be prevented, but the dampness rising from ground filled with garbage and all kinds of filth from streets and alleys, and the gases rising therefrom become dangerous to health. The matter is being discussed in New York as to the proper cementing of basement floors especially in tenement houses. Complaint is made that these floors are of poor quality of cement and too light to be of any service. We all know the carelessness with which tenements are built, and when it comes to providing the requirements of sanitation, these houses are miserable failures. In many of our cities ordinances are rightly and justly enacted compelling proper plumbing and drainage, and the relation of this to increased healthfulness is marked. Entire buildings should be as closely guarded in this respect as the plumbing, and good strong asphalt and cement floors should be required by law. In this and other cities reports have been made of families sickened and enfeebled through poorly constructed basement floors and foundation walls. Health departments will find it worth their while to turn their attention in this direction.

The healthfulness of a city is not complete when proper sanitation is provided for its better parts. The business portion of a city and its principal residence portions may be neat, clean and conform to the best requirements of hygiene, and yet the city be in a state of unhealthfulness as regards its poorer quarters. These portions with the tenement houses, factories and workshops, may be allowed to stand in such unsanitary conditions as to endanger the entire city. These quarters are almost universally neglected in cities without recognition of the fact that from these poor and filthy quarters can originate an epidemic which would spread throughout the city. A chain is no stronger than its weakest part, and a city's health is not secure while these disease spots remain within its limits. The neglected drainage, sewerage, streets, alleys, dwellings, workshops, all are fruitful soil in which the seeds of contagious diseases may fall and grow. No portion of a city however cleanly and well kept is safe while there exist places so favorable to the spread of disease. The most careful supervision of these quarters is an absolute necessity. The removal of garbage, adequate sewerage and drainage and all the demands of strict cleanliness should be supplied, and the same care be given as is bestowed upon the best residence portions of the city.

Do good work and stick to good prices seems to be the motto that plumbers should adopt in some localities, and it should be pasted in the hat of all plumbers.

VALUE OF BOARDS OF HEALTH.

At a recent meeting of the Tennessee State Board of Health, J. Berrien Linsdley, M. D., one among the most efficient secretaries of health boards in this country, submitted his quarterly report, in which he said regarding state boards of health:

A few years ago the State Boards of Health of the United States and Canada entered into a compact by which each board is obliged to notify all the others of the presence of contagious and epidemic diseases. This agreement is specially binding in reference to small-pox, yellow fever and cholera.

Practically it has proven of great service by at once giving the health authorities of six million square miles early and authentic information of the existence of either of these dreaded pestilences in any part of this vast area. As a consequence vague rumors and alarms have disappeared, and whenever necessary immediate and rigid steps are taken to confine an epidemic to the locality of its first appearance.

The recent history of small-pox is a striking demonstration of the above statement. Take the present year. This loathsome disease has appeared in Kentucky, Minnesota, Ohio, Pennsylvania, Wisconsin, Canada and other localities.

In every instance the precautions taken are isolation, vaccination of all exposed persons, closing of schools or hotels when infected, and thorough disinfection. Uniformly the same result. The disease is stamped out at once and the local public saved from a scare and heavy financial loss.

The recent outbreak of small-pox in a camp occupied by railroad builders near Big Stone Gap shows what can be done by prompt and skillful management. The class of people among whom it occurred were of the most neglected character; the location a remote mountain region, and yet by railroad connections peculiarly favorable to its spread. For a few days great uneasiness prevailed in half a dozen counties in Virginia and throughout upper East Tennessee. Then the scare was all over and no spread of the disease. A wonderful contrast to what uniformly occurred even as late as ten years past. Then the first cases would have been overlooked, and the public not aroused until an epidemic prevailed, entailing loss of life and property, as is fully shown by the records of quite a number of Tennessee counties.

The recent occurrence of small-pox in the city of Knoxville, in a locality where it could easily spread, and its prompt management by the local health authorities is another splendid demonstration of the great value of state preventive medicine. Here in a large and populous city a threatened epidemic is choked off at very small expense and without uneasiness to the public. Compare this with what happened but a few years since in Montreal, and a little longer back in Philadelphia and Louisville, and we have a measure of the rapid progress and great efficacy of public health work.

Prompt notification, absolute isolation, thorough disinfection and sanitation would produce like results in preventing the spread of diphtheria, scarlet fever, measles and all similar diseases. The people are becoming more and more enlightened on this vitally important subject, and in not a few localities are adopting measures for prevention of these affections which at present destroy so many young lives and blight so many cherished homes.

NOTES AND NEWS.

Petroleum has been found at Gaspe, Quebec, at a depth of 2,300 feet. It is said to be equal in quality to the best Pennsylvania oil.

A recent English invention is a machine which bends tubes without the necessity of filling them with some yielding material to preserve an accurate section.

Eight per cent. of the people of Europe were attacked by influenza.

Canned salmon found several victims in London during the first week of July.

Egyt is overrun with foreign physicians, who have no visible means of support.

In Australia green boughs of the eucalyptus are utilized in the sick-room as disinfectants, and to relieve the cough of phthisis.

Two tunnels of cast iron for an electric railway have been built in London and put in operation for rapid transit. They are three miles in length and lie between forty and sixty feet below the surface of the city's streets.

The amount of coloring matter in a pound of coal is enormous. It will yield enough magenta to color 500 yards of flannel, vermilion for 2,560 yards, aurine for 120 yards, and alizarine for 155 yards of Turkey red cloth.

Canon Harford, of Westminister, is so profoundly impressed with the value of music as a therapeutic agent that he advocates the formation of a band of "orchestral physicians."

A new petroleum burning boat was tried near Berlin, Germany, with a four horse power engine, which went from six to eight miles an hour at an expense of 2 cents per hour. The engine needs only one man to tend it, and he can also steer.

A discussion on the size of water mains at a recent meeting of the New England Water Works Association it was stated that 6 inch was the smallest size of main which was suitable to supply water for fire service. Even this size should not be used for a greater length of pipe than 600 feet, except, perhaps, in suburban districts.

The Chief Inspector of Factories in London has given some important testimony in regard to the value of trades unions. In a recent report he says that the condition of the workers in the east of London has greatly improved within the past few years. Formerly they worked under conditions of wretchedness and horror that were terrible. The workrooms were without ventilation and the "sweating" system was general. "Now," states the report, "all is changed. Large, healthy workshops have in many cases been erected. The very appearance of the workers is altered. From having been stolid and despondent they have become bright, intelligent and hopeful. The transformation has been caused mainly by the foreigners and natives forming themselves into a union, and having risen in rebellion against the sweating system and the insanitary condition that prevailed."

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The cry against the smoke nuisance continues to go up not only from our own city but from many of our sister cities. These complaints are general and not specific enough to locate the difficulty. The cry is against smoke—smoke at morning, noon and night, smoke in the streets, in hotels, public buildings and dwellings, smoke that depreciates values and injures health. The cause of this evil, the difficulties that lie in the way of its abatement, and the lack of means, of law and official action, are not pointed out and complained of specifically. Smoke is the natural product of imperfect combustion and imperfect combustion is the inevitable result of recklessness or neglect, and recklessness and neglect are the offsprings of lax administration of laws or the outgrowth of no laws at all. When complaint arises against the smoke nuisance, that complaint should be gathered into specific charges and followed down the line till the prime obstacle is discovered. Here work should be commenced and all energies centered. The producing cause, whatever it is, must be removed. We write this in response to several letters from cities complaining of the smoke nuisance and asking for suggestions regarding its abatement. These letters are all too general. They are not specific enough to give one not familiar with the cities any idea of the nature of the remedial agencies to be employed. We are simply told that the smoke is an intolerable nuisance, and asked for some remedy that can be effectually applied. There are some so-called doctors who advertise that they can diagnose disease and provide cures from a lock of the patient's hair. We trust our correspondents have not mindfully classed us with such "doctors." Regarding the abatement of the smoke nuisance, we have not yet evoluted enough to be able to recommend a remedy from the color of the smoke. We must have a better basis for a proper diagnosis than this. We want to know if there be ordinances against smoke production which, if properly enforced, would abate it; if there be officials selected whose duties are to enforce this law; if these officials are capable, if they can and will discharge their simple duty; if they are sufficiently informed regarding the matter to take up the work intelligently; if they have made it a study and are familiar with the best approved methods provided for smoke prevention; if popular sentiment has

ripened into a determination to abate the nuisance; if the people are willing to resort to their rights and supercede their special officials in the enforcement of the law despite official inaction and obstruction—regardless of political pets with which too many officials are inclined to toy. These are some of the details in regard to which we wish specific information when making an attempt to point out a remedy for this great and growing evil. If there be scientific principles involved they should be stated fully and definitely, for only a half answer can be returned to a half question.

The period in investigation and experimenting has now arrived when we can safely assume that smoke can be prevented. The means have been supplied, and the question now is, how are these means to be employed. The means have been mentioned in these articles, and they consist of mechanical devices which have been tested and found efficient. They are in successful operation at present, and what is now wanting is some method of getting these devices in use. Their merits alone are enough to recommend them if properly understood, but the trouble is smoke producers give little heed to public comfort and go forward creating this evil, caring little how easy it is to prevent smoke or how simple and economical the means. In the face of these facts the public goes on suffering this inconvenience and injury, yielding to the selfishness of a few, when they might escape all these ills. Every city suffering from the evils of smoke should enact strict ordinances against the nuisance and then see that the ordinance is enforced. It will not suffice to rely on the will of smoke producers. That has been tried and nothing accomplished. Years of experience have proved that it is the will of furnace owners to produce smoke. It is not the will of these men that is to be consulted. It is the will of the public that should receive consideration, and it is through the enforcement of this will that this great nuisance is to be abated.

We have repeatedly stated that the smoke nuisance can be abated, and in the presence of all objections and expressions to the contrary, we find no reason to withdraw the statement. We have listened to all objections and have investigated them patiently and thoroughly, and the more we investigate the more firmly are we convinced that the smoke preventing devices now existing are sufficient to prevent smoke when their use is properly enforced.

The *Inter Ocean* in its issue of July 28, published an illustrated article on the smoke nuisance in this city as seen from the observatory of the Inter Ocean building. The number of violators observed from this point is truly astonishing in a city where the means for smoke prevention are so near at hand. But these charges, grave as they are, do not tell the whole story. A stroll in almost any direction reveals to the spectator scenes which must make anyone blush who has the pride in his city he should have. We have noted the efforts put forth to abate all this, and have commended them. They have been in the right direction but something is the matter or there could be seen some effect of these efforts. Do the citizens whose property is being daily injured and whose health is being continually impaired take the active interest in this matter that they should? When the guests of some of our popular hotels complain to the proprietor of the smoke nuisance, we must confess that we have a sad commentary on the cleanliness of our city and the purity of the atmosphere of the World's Fair city. But this can all be remedied, and we fully believe it will be. It is possible, and so great a good will be accomplished when it is so clearly an end that can be attained. It is the history of all wrongs that they have in a measure righted themselves in becoming so oppressive as not to be longer borne. So with the smoke nuisance of our cities. It will become in time intolerable, and then the citizen will have it abated regardless of the indifference or inaction of officials. This time is not so far in the future. It is present in many cities as evidenced by the inauguration of vigorous measures looking to the immediate abatement of the smoke nuisance.

FUEL GAS.

At the seventh annual meeting of the Ohio Gas Light Association, Mr. George H. Christian read a paper on the "Present Outlook for Manufactured Gas," in the course of which he said:

"The use of natural gas has given a great impetus to the demands by the people for fuel gas, yet the experience had in the burning of natural gas by the very wasteful methods now employed, will hinder rather than advance their chances for obtaining the manufactured article.

"On account of the large amount of capital invested in the illuminating gas business, it devolves upon these companies to utilize their present plants to convey gas for fuel as well as light, and they must take the initiative in this movement. Let the manufacturers of coal gas and carbureted water gas combined calculate the cost of their gas in the holder per 1000 feet for material, labor and repairs, in any section where gas coal can be had for $3 per ton, and Lima naphtha for three cents per gallon. The gas made will be nineteen-candle value, and contain 750,000 units of heat. I believe I do not err when I say that the present cost for distribution, interest, taxes, etc., does not exceed the cost of gas in the holder in any works the bonded debt of which is not excessive; and it should be remembered that by doubling the amount of gas sold you should reduce the distribution cost more than one-third.

"Natural gas companies are selling gas for fifteen cents per 1000 feet. Interest, taxes, distribution, improvements and repairs must amount to six or seven cents per 1000 feet, leaving them a profit of from eight to nine cents. This sum has been ample to pay large dividends, and set aside a surplus. Allowing ten cents per 1000 profit to illuminating gas companies on their sales of gas for fuel purposes, at what rate can they afford to sell such gas?

"Suppose, for the sake of an example, that some company should be so favorably situated as to feel warranted in making this rate fifty cents per 1000? Can the consumer afford to pay this price for gas for heating and cooking? Natural gas as now wastefully burned is, at fifteen cents per 1000, equal in price to hard coal at $3 per net ton. When we can burn coal gas with a total efficiency of sixty-five per cent, 15,000 cubic feet of it will do as much heating as 20,000 cubic feet of natural gas now does Coal gas, then, at fifty cents per 1000 would equal hard coal at $7.50 per net ton. This is so little in excess of the cost of hard coal fuel, when we consider the cost of removing the ashes and dirt, that I believe its general use as a fuel at that price could be assured."

PLUMBING FOR WOMEN.

The New York *Post* has interviewed women and some leading plumbers in regard to the practicability of women acquiring some knowledge of plumbing, and the following is the result:

What do women know of plumbing? Politics, the professions, trades innumerable, questions of finance and of political economy —all are grappled by the feminine mind. Women's clubs abound, the avowed object of which is the all-around advancement of the members in questions pertaining first to the home and then to the well-being of society at large. It is a question, however—if one may dare to say so—whether the many and often vexing problems relative to home economics are attacked with anything like the enthusiasm bestowed on woman's equality with man, woman's suffrage, the higher education of woman, and like questions. That astonishing progress has been made by women during the last half century is an incontrovertible fact. Nevertheless, the advance has been greater along almost any other avenue than that appertaining to the intelligent comprehension of the improved appliances placed at their disposal in the modern dwelling, even if in the ordinary departments of housekeeping a retrograde rather than a progressive movement has not taken place. It may be doubted whether the old-fashioned housekeeper, to whom women's clubs were unknown, was not the superior of her more "advanced" sister as a practical and painstaking manager.

In considering the requirements of modern housekeeping, take for instance, one feature—that of plumbing. Scarcely a household but has experienced the ills resulting from bursting or leaking pipes—ills which entail greater inconvenience to the feminine than to the masculine members of the family; therefore it should naturally follow that the mistress would be specially interested in preventing or ameliorating such disasters, and that the subject would receive at least a portion of the intelligent thought she is so willing to bestow in other directions. It is a lamentable fact, however, that in an emergency not one woman in fifty knows how to

turn off the water supply, not to speak of arresting a leak, of no matter how infinitesimal proportions.

In conversation with several leading plumbers, each gave as a result of his experience the opinion that women are wofully ignorant where plumbing is concerned. One declared: "I have on several occasions given plain directions how to act in case of a leak or other casualty until the plumber arrived, but as often have found when the time for action came they had been entirely forgotten. Even the simple expedient of turning on the water in the kitchen or laundry, which of course would prevent its running to the upper floors, is usually quite overlooked." Another said: "I never have any success in explaining the intricacies of plumbing to a woman, whereas to the masculine contingent I have no difficulty." From this it would seem that the intelligence of woman is unable to cope with what is so easily understood by man. A third plumber remarked: "Women are always in fear that the hot water boiler will collapse if the water is cut off, and for this reason as much as any they hesitate about tampering with the faucets; whereas a very slight knowledge of the subject would convince them that if in conjunction with turning off the water the sink faucets are opened, so that air can reach the boiler, no damage can result." While each plumber admitted that a knowledge of the fundamental principles of plumbing on the part of women would often save considerable expense and damage none was enthusiastic, evidently preferring ignorance to an enlightenment which would perhaps curtail his opportunities.

A woman, bright and intelligent to an unusual degree, was asked regarding her knowledge of plumbing. Said she: "I am sorry to confess I know nothing whatever about the plumbing of this house. I do know, however, that the pipes very frequently need attention and that what appears to be a very tiny leak often necessitates tearing up the floors, a great amount of labor, and a corresponding large bill. I have often thought I would like to understand a little about the matter, but as often have dismissed the thought, pleading with myself lack of time and opportunity." "I am confident," declared the occupant of a house up-town, "if I had known how to use a soldering-iron I might have been saved much inconvenience and money last week. For some time the hot-water pipe in my wash closet leaked slightly at a turn in the pipe near the floor. The leak was so small that by making a plaster of soap and applying it I prevented any damage to the floor. One day, however, when it was necessary to send for a plumber to do work in the lower part of the house I asked him to take a look at the pipe in question. As a result the different sections were taken apart and put together again, and the floor was taken up, the whole making a job of some hours' duration. The next day I discovered that the pipe leaked exactly in the same spot as before." Still another asserted: "I am confident plumbers do not always make a correct diagnosis. On more than one occasion my husband has failed to agree to their propositions, substituting modifications which have been acted upon with as good results and less expense. Now, if left to me, I should through sheer ignorance be obliged to accede to any proposition, even though it involved pulling up every plank in the house."

It seems no general rule beyond allowing the water to escape in the lower part of the house can be laid down for emergencies, the plumbing in various houses differing so greatly; consequently for practical purposes each householder should become familiar with the distinguishing features of her own system.

At the trade schools, First avenue and Sixty-seventh street, the number of young men attending the plumbing class is almost double that in any other, thereby indicating the great demand for such workmen. In conversation with the head of the schools and with the manager of the plumbing class, both expressed themselves in favor of women acquiring some knowledge of the science of plumbing. Said the latter: "I should consider the practice of plumbing in all its branches heavy and disagreeable work for a woman, but a knowledge of the theoretical part would be invaluable from a sanitary point of view if from no other, causing her to detect imperfections which, when neglected, are often a prolific source of so-called malarial maladies." In response to a question he replied: "Undoubtedly women can be taught to stop a leak, provided they don't mind burning their fingers in the process." "As a rule," he continued, "women are called upon to oversee the plumbing of their houses to a much greater extent than men. In nearly every case the application for a plumber comes through a woman and frequently the workman never meets the master of the house at all." A suggestion that the autumn course of lectures in plumbing should be open to women, and that in addition practical class instruction should be given in the primary principles of plumbing—instruction which would bear directly on the ordinary householder exigencies—was not unfavorably received. "I can readily agree," said the proprietor, "that women shall be admitted to the lectures, and if a sufficient number should desire practical instruction to make it worth while to form a class, I have no doubt their wish would be complied with."

THE BEXLEY SYSTEM OF EMPTYING CESSPOOLS.

In small towns or villages in rural districts, says *The Builder*, where facilities of sewage disposal do not exist, as well as in connection with isolated mansions or cottages, cesspools appear to be inevitable, if we except the alternative of dry earth closets. Sanitarians are divided in opinion as to the merits of the two systems. While both systems have certain disadvantages, they have at the same time certain advantages, provided that they are constructed and used under proper conditions. To confine our remarks in this brief article to cesspools, it is self-evident that where those receptacles of filth cannot be dispensed with, they should be properly constructed and rendered impervious, and they should also be placed as far as possible from any dwelling. If we mistake not, the model by-laws of the Local Government Board stipulate that no cesspool shall be placed within fifty yards of any dwelling—a very useful stipulation if it be strictly observed. But assuming that a cesspool be properly constructed and located, something more has long been wanted, viz., a method of emptying it by day or by night without causing intolerable nuisance to the whole neighborhood during the operation.

Such a method has been devised and brought into operation at Bexley and Bexley Heath by Mr. E. Reeve Boulter, the Surveyor to the Bexley Local Board, and recently we had an opportunity of witnessing it in operation at Bexley Heath. Mr. Boulter, of course, does not claim that the whole details of the method adopted by him are novel, but he does claim, and apparently with justice, to have introduced certain improvements on pre-existing methods. He has, however, sought no protective patent rights, but places the results of his practical experience at the disposal of all surveyors and sanitary inspectors and health authorities.

The plant used at Bexley consists of two iron tank vans each holding about 400 gallons; two of Waller's cesspool pumps, 280 feet of leather hose, to connect the vans with the pumps, two lengths of suction pipe to connect the pumps with the cesspools, and one hose reel. So far there is nothing novel, except in points of detail.

The vans are made by Messrs. Hora, of Camberwell. Each is provided on the top with a screw-down air-tight manhole (only opened for the periodical cleansing of the van); with a flat ∩ shaped pipe connection for the attachment of the hose; with a simple automatic cork float indicator to show when the van is nearly full; and with an air cock of special construction to allow of the innocuous escape of air from the interior of the van as it becomes displaced and driven out by the matter pumped into the van. It consists of a short length of metal tubing with a cock surmounted by a metal basin, 5 or 6 inches in diameter; this basin or cup is in its turn surmounted by a hinged wire-barred cap or cage. The basin or cup, and indeed, the whole of the space within the cage is filled with wood shavings and chips saturated with "Sanitas" fluid, and kept moistened as often as may be necessary. When the van is about to be pumped into, this air cock is opened, allowing the air expelled to pass through without the least offense to the nearest passerby or to the nearest house with open windows. The hose may, if necessary, be brought through a passage or room without causing any nuisance.

The *modus operandi* is to open the cesspool, pour in a sufficient quantity of deodorizing fluid, consisting of manganate of soda (a green powder) diluted with water, and then to stir the whole contents with a pole so that they become thoroughly mixed; such is the power of the deodorant that this operation is rendered inoffensive to the sense of smell. The suction pipe is

then inserted, and the contents of the cesspool pumped into the tank van. Should one van become full before the cesspool is empty, of which fact the float gives indication, the order is given to cease pumping for a moment, and the end of the hose is disconnected from one van and connected to the other, an ingenious metal diaphragm arrangement coming into play to retaint the contents of the hose pipe, even though the latter be placed in a recumbent position. The vans when full are taken on to agricultural or market garden land, and the contents discharged into plow furrows as the van travels along. The arrangements for discharging the contents consists of a short length of hose depending from an opening 7 inches in diameter in the bottom of the van and toward the rear. This opening is stopped by a conical ground-in-plug, raised or lowered by a rod and screw from the top of the van. To facilitate the complete emptying of the van, there is an arrangement for slightly tipping it.

At Bexley the work is carried out by the Local Board staff, under the direction of the surveyor, at a moderate scale of charges, £1 1s. being charged for emptying a cesspool containing not more than 1,200 gallons, graduated up to £2 5s. for a cesspool of 3,000 gallons capacity. Since August 1, 1890, when the system came into operation, nearly 300 cesspools have been emptied by the board's staff.

ABOUT HOT-WATER HEATING.

Extracted from the *Heating Engineer*, of New York:

In the design of a hot-water heating system, the first question considered by the fitter is: the quantity, location, and distribution of the radiating surface. Having arrived at a conclusion, by theoretical considerations, or possibly by previous experience in the same line, the next point for determination is the style and size of the boiler to be employed. It is not our purpose to consider the latter of these determinants, there being on the market to-day many styles of boilers, each possessing peculiar attributes of its own, and for all of which many good points are claimed.

Passing, therefore, to the second topic, that of size, we meet at once, upon consulting the circulars of the various manufacturers, a remarkable variation in sizes specified for given areas of radiating surface. For example, one circular gives the number of square feet of radiating surface supplied by one square foot of boiler-heating surface, 22.8, another runs as low as seventy-five, and many can be found giving ten square feet of radiating surface per square foot of boiler-heating surface. The reason for such a wide variation in proportions, which, when we remember that the sought-after result, viz., the heating of a fixed maximum number of degrees, is constant, has been attributed to difference in detail, in material, and in proportions of the boiler. When, however, it is remembered that many of the hot-water boiler manufacturers are interested in some one of the many forms of hot-water radiators, a further factor contributing to the variation above spoken of can be discovered. We allude to the amount of water contained in the heating system.

Without attempting to enter into the vexed question of the exact cause of the circulation in a hot-water system, about which Tredgold, Bramah, Hood, Mills, Baldwin have presented able arguments in support of their own theories, we will simply accept the fact that there is motion, and that motion is occasioned in some way by the application of heat to some part, preferably the lowest, of the apparatus, thus causing a disturbance of the hydrostatic equilibrium, resulting in a flow.

One point here: it is a recognized fact that a clean, sharp fire, consuming about four-tenths of a pound of coal per square foot of heating surface per hour, results in a maximum economy of fuel. Dr. Chas. E. Emery, in his very able report on the Centennial Boiler Trials, was the first to demonstrate such a fact. And from the same trials there follows as a corollary to this statement, that two boilers of radically different types, but of good design, burning the same coal at the above rate, the potential and economic merits will be found equal. This applies to our subject in this way: when we have a minimum amount of water in circulation n our system we can employ a minimum size of boiler, thus insuring a near approach to our figure above given. Again, Baldwin, in his work on "Hot-Water Heating and Fitting," states very clearly, concisely, and accurately (page 210): "Anything that quickens the circulation through or within a boiler or over its fire surfaces will increase its capacity per unit of surface." Hence, where a minimum amount of water is in circulation the difference in temperature between the flow and return will be greater; hence the velocity of the flow, and consequently the circulation, will be quickened, and we can use a smaller boiler than we could were our quantity of water greater and our circulation more sluggish. It may be argued here that when we increase our velocity we increase our friction; true, as far as such a general statement of fact goes, and if the velocity was as great as is frequently found in city water mains, an increase in rate of flow might be a serious consideration. But Box has shown ("Practical Treatise on Heat," page 200) that with a two-inch hot-water heating pipe one hundred feet long, exposed to air at sixty degrees, the water leaving the boiler at two hundred and ten, returning at two hundred, the velocity in feet per second is less than four-tenths, and for greater difference in temperature between the flow and return and for larger-sized pipe the velocity is much smaller. We may, therefore, dispense with the idea that with an increased velocity the loss of heat by friction is sensibly increased.

Again, with the minimum quantity of water in the system, and consequently a more rapid circulation, it follows that the building will be more quickly warmed or cooled than when a greater quantity of water is employed. In other words, one of the great points claimed as a superiority of hot water over steam, viz., susceptibility to automatic government by change in outside conditions of temperature, is most apparent when we have a minimum amount of water in circulation per square foot of radiating surface.

THE ART OF MEDICINE VS. THE MACROBIOTIC ART.

The macrobiotic art, the art of prolonging life, says the *Canada Health Journal*, has been sometimes distinguished from the common art of medicine, its means, aims and boundaries being said to be different. It is to be much feared that in the practice of the "healing art," in the prescribing as well as the taking of medicines, the distinction is not recognized as it should be. The object of the medical art is rather health; that of the macrobiotic art, long life. In sickness, both the physician and the patient are too often only intent upon the restoration of health; forgetting sometimes, it is to be feared, that the means employed to restore health may tend to eventually shorten life. Whoever, physician or patient, thinks of enquiring whether by the means employed to regain the health which has been lost, life, upon the whole, will be lengthened or shortened? Is it not very well known, and probably few medical men will deny, that life is not infrequently unnecessarily shortened (not so often markedly at the particular time, but in the long run) by many of the methods employed in curing disease? It is not that this point would often be disregarded in practice were it sufficiently considered, but it is simply overlooked. It appears that long life has ever been the great, chief wish, the principal object, of the great majority of mankind. We all know how numerous yet how confused and contradictory have been the methods of obtaining it; from the really valuable writings of Hippocrates on the six articles—air, ailment, exercise and rest, sleep and watchfulness, repletion and evacuation, the passions and affections of the mind—to the efforts of the Alchemist and Rosicrucias, and thence down to recent times, when the medical art endeavors to elevate mankind to the highest possible degree of physical strength and perfection. "Training," as frequently practiced, shortens life. And it is highly probable that the developing and strengthening, to the fullest extent, of the physical man, without, at the same time, developing and strengthening the moral or mental powers, may so accelerate life as to shorten its duration.

The conservative influence of disease, or especially of many of the symptoms of disease, is now very generally recognized. The process of inflammation occurs in obedience to a conservative law. Fatty degeneration of the heart causes reduced heart force, which may save the patient from apoplexy. It has been suggested that articular rheumatism, inasmuch as it is commonly associated with heart disease, is conservative, by necessitating muscular rest.

But the medical art is constantly, and perhaps too indiscriminately, breaking in upon and checking the progress of important conservative influences. Take a common symptom of disordered

digestion, loss of appetite, probably from overeating. Means are usually at once employed, bitters and tonics are taken, to remove this, to produce a false appetite, instead of employing nature's remedy, as plainly indicated—abstinence, fasting—until the return of the natural appetite. No one can say that the taking of bitters and tonics will not, under such circumstances, lessen the supply of vital force, and eventually shorten life.

So that in all efforts to promote health, to cure disease, and especially perhaps to remove or treat symptoms, the possible future effect upon life should not be lost sight of.

CAUSES OF NERVOUS DEBILITY.

As, a long while ago, I installed myself in my new dwelling, I was not a little surprised on first inspection, to find a condition of things which ran precisely counter to my wishes and directions. This disappointment was chiefly ascribable to the multiplicity and variety of colors that had been selected. Not that my favorite tints had been forgotton; but the great diversity displeased and disappointed me so much the more, as I had previously directed that a decided tone should be preserved in respect to all the other colors which were to be purely decorative and that were simply to be brought in unison with the primary tint. To my representations I received the answer: "Such a disposition is modern only, and in regard to the unity of effect I might fully tranquilize myself. Not until the entire apartments had been fitted up in the manner proposed, would everything blend together, and thereby a harmonious effect and *ensemble* be produced." This view, however, I could not at all concur in, for the contrast of color was so vivid that it impressed my eyes disagreeably in the highest degree. To this the fact also contributed that the tints were of the liveliest tone. As a sequence to this disagreeable impression, I experienced a certain weakness of this organ, which, in view of the frequent recurrence of such over exertion, was in nowise slightly prejudiced, for the eye has its nerves as well as every other organ. The more force exercised by the former, the stronger becomes its influence upon the latter, for in the inverse ratio with the strength of the eye decreases that of its nervous constitution—a condition which is called nervous debility, or rather nervousness. We must therefore speak of such in respect to the eye just as in respect to any other organ, in so far as it is nervously debilitated in exact proportion as it is itself weakened. What is characterized for the most part as nervous debility in a person is, in fact, nothing more than the sum of the nervousness of the individual organ. As a consequence it is not a matter of indifference how we select the colors of our dwellings. Daily our vision wanders over the latter, and it will not escape the attentive observer how much the vivid and dazzling irritates the optic nerves, how much a mild and healthy primary tone, on the other hand, will animate and refreshen it. For this reason it is highly important that our eyes be accustomed to rest upon a prevailing tint with which everythtng will naturally harmonize. This is applicable not merely to the dwelling, but also to our clothing, and so on; in short, to all those subjects in which we have to deal with colors. Still more frequent occasions for rendering the eye nervously weak are afforded by conditions of light, for too much as too little light is equally prejudicial. In earlier times duskiness was agreeable. People sat often and long in dark rooms and were pleased to order lights not until it grew late—late, at least, in the present acceptation of the term, when they insist in living as far as possible in a "full light." But they do not reflect that as a general rule they carry this too far, and that thereby a strong impulsion is given to an ever-increasing shortsightedness. Self-observation and experience will here teach what is the just mean, as I have shown in detail in my work on the preservation and cure of nervous debility. A third faculty of the eye is that of perceiving the shapes and forms of things around us. Here, too, no excess should be committed in our contemplation of too many men or objects, especially when the latter are passing before our eyes in rapid alternation. This is the more important, as without this the eye is very much exerted, and therefore peculiar conditions demand corresponding foresight. That reading too much fine print, and so forth, should naturally do injury to the eye every one of my readers will already sufficiently know. Not less than our organ of sight, that of hearing demands a like care and economy. While men accord to the body through the agency of athletic and gymnastic exercises a systematic development, this sense has to content itself for the most part with what casually falls to its lot. One does not consider the fact that the ear is irritated and weakened by the din of machinery or the uproar of the street, etc. He is surprised, indeed, to find that his ear for music becomes more and more prejudicially effected by a residence in noisy cities. The senses and the brain must be sedulously fostered, if we wish that their power should remain more or less intact. This attention should be accorded them not alone for their own sake, but also for the sake of our bodies, which sustain all the more detriment the greater the damage experienced by the former. Experience teaches that in the same ratio as our organs of sense and mental power, become enfeebled, disorder and debility manifest themselves in our digestion, respiration and capacity for movement, and innumerable nervous maladies remain unhealed and uncured for the reason that the relations between the body, mind and sensorium are not carefully watched and preserved.—Dr. Strum (Berlin). Translated for *Public Opinion* from *Berlin Ueber Land und Meer.*

REVIEWS AND NOTES.

"An Elementary Hand Book on Potable Water" by Lloyd Davis, M. Sc., Ph. D. Silver, Burdett & Co., Publishers, 6 Hancock avenue, Boston.—The above is an important work not only to scientists and experts but to the general public. There is nothing of such general use and interest as water, and the fullest information regarding the character of this necessity should be obtained. This work is not technical enough to prevent it being clearly understood by all, and it is scholarly and scientific enough to insure its correctness as an authority. It is a book adapted for the many and not the few. To physicians, chemists, sanitarians, and all persons connected with or interested in the advancement of public health this work will be found useful and helpful. It is the work of an able sanitarian and chemist, and the result of years of labor of close investigation, and is based on the study and analysis of nearly one thousand water supplies. The importance of such a work, covering this vast field can be easily reckoned. From the following brief prospectus an idea of its nature and scope can be gained:

Chapter I. treats of Pure Water, and defines the terms pure and impure, wholesome and unwholesome, from the sanitary standpoint. Chapter II. is devoted to Inorganic Constituents. Chapter III., to Vegetable Constituents; and Chapter IV., to Animal Constituents. Chapter V. presents in its twelve pages a remarkably interesting and instructive treatise on Micro-organisms, showing patient study and extended research. Chapters VI., VII., VIII., discuss Water Supplies, Natural Purification, and Artificial Purification, and Chapter IX. describes clearly and with proper minuteness eight different Systems for Central Filtration. An Appendix, divided into two sections, closes the book. Section A treats of the Origin and Home of Cholera. Section B presents four qualitative tests for impurities in drinking-water. The importance of the subject will appeal to all intelligent readers, especially such as have in any way to deal with zymotic diseases. The work contains 120 pages, 5x7¼ inches, bound in cloth, and is sold for one dollar. Mailed to any address on receipt of price.

The Progress of the World in the forthcoming August number of the Review of Reviews opens with a discussion of Chicago and the World's Fair, from the pen of Dr. Albert Shaw. Dr. Shaw is well known as a student and observer of city-making and municipal government the world over, and therefore his very high tribute to Chicago will doubtless be appreciated in that city. The article is accompanied with portraits—drawn by Mr. Valerian Gribayedoff of New York—of a number of leading people connected with the management of the Columbian World's Fair. Dr. Shaw is confident that the fair is to be an unexampled and brilliant success.

"Sexual Neurasthenia," By George M. Beard, A. M., M. D. E. B. Treat, publisher, 5 Cooper Union, New York. This work consists of the posthumous manuscript of Dr. Beard, and is edited by A. D. Rockwell, A. M., M. D. A work on this subject from so reliable a source as this cannot fail to attract great interest and have a wide circulation. This work is not based on theory but on scientific investigation and practice. It is based on the ob-

servance and treatment of many cases, and the deductions are drawn by one whose learning and ability and whose devotion to his profession place him foremost among authorities. No one has had better opportunities to study these too common derangements than Dr. Beard had, and the high repute in which he was held lends to the work the assurance of public confidence. The work is not only scholarly but it is systematic, instructive and readable. Cases cited, diagnosis, treatment and formulas comprise this most excellently written work on a subject important enough to elicit much study. Touching such important matters, the work is to be highly recommended. It can be secured through the trade or publishers for $2.75.

POINTS ABOUT ADVERTISING.

John Wanamaker says: "I never in my life used such a thing as a poster or dodger, or handbill. My plan for fifteen years has been to buy so much space in a newspaper and fill it up with what I wanted. I would not give an advertisement in a newspaper of 500 circulation for 5,000 dodgers or posters. If I wanted to sell cheap jewelery or run a gambling scheme I might use posters, but I would not insult a decent-reading public with handbills. The class of people who read such things are poor material to look to for support in mercantile affairs. I deal directly with the publisher. I say to him, 'How long will you let me run a column of matter through your paper for $100 or $500?' as the case may be. I let him do the figuring, and if I think he is not trying to take more than his share I give him the copy. I lay aside the profits on a particular line of goods for advertising purposes. The first year I laid aside $3,000; last year I laid aside and spent $40,000. I have done better this year, and shall increase that sum as the profits warrant it. I owe my success to the newspapers, and to them I will freely give a certain profit of my yearly business."—*Indian Rubber World.*

FOR THE DIGESTION.

Unless a man lives as high as he shouts the less noise he makes the better.—*Ram's Horn.*

Perhaps it is because history repeats itself that some of it gets so very dry.—*Washington Post.*

When a sick man refuses to send for a doctor that is a sign that he still clings to life.—*Texas Siftings.*

The man who selected his wife, as he would his clothes, for wearing qualities found that she wore him out.—*Life.*

This summer is cautioned to look out for a soft place to light. There's a fall just ahead of it.—*Washington Star.*

"Though I speak but one language I am familiar with many tongues," said a physician.—*Buffalo Enquirer.*

Maud—"Is it true that you are in love with Mr. Bullion?" Clara—"Mercy, no, I'm only engaged to him."—*New York Weekly.*

"Are you going away this summer?" "No, I shall stay at home?" "Why?" "Because my wife is going away."—*Lowell Citizen.*

Kind Lady—"And if you pile up this wood properly I will give you some more work to do." Weary Raggles—"Den I t'row up de fust job, mum."—*Puck.*

Spacer—"What can I say to this obtuary for Ginsling, the bartender?" Editor—"Work in something about his 'having a smile for every one.' "—*New York Herald.*

Baseball Fiend—"I heard you had a match with your wife last night, Batsy. What's the score?" Batsy (mournfully)—"She shut me out."—*Baltimore American.*

Jagson says he has foumd more grass widows in clover than in weeds.—*Elmira Gazette.*

Too many silly young couples drive into matrimony with a blind bridal.—*Washington Star.*

When a man feels that his pores need opening he will find a little sage tea to be a wise decoction.—*Binghamton Leader.*

One reason why some people are not so wicked as others is because they haven't had so good a chance.—*Ram's Horn.*

"You know so much, Miss Vassar," said young Pert, "that I thought, perhaps, you could tell me why the seaside?" "Certainly," she replied, equal to the emergency; "doubtless it was because the sea was blue."—*Baltimore American.*

Cora—"You never played baseball, did you, Jake?" Jake—"O, yes." Cora (yawning)—"Well, of course you never made a home run."—*New York Herald.*

"College education? Pshaw! What good did it ever do young Cutter?" "Lots of good! Why, every ball team in the country is after him!"—*Boston News.*

"Whom the Lord loveth he chasteneth," and it must make him feel very tired to hear the guilty men who are justly punished for their sins lay their punishment to the extreme love of the Lord.—*Atchison Globe.*

A.—"So you have sworn off from using tobacco?" B.—"Yes, I suffered a good deal during the first week, but after that I felt all right." "What did you take to allay the craving for tobacco?" "I took to smoking again. That allayed the craving right off!"—*Texas Siftings.*

Floor Walker—"Madam, may I enquire why all this paraphernalia is spread out right in the way of customers?" Madam (calmly)—"This is my portable table, folding chair, alcohol lamp-lunch basket, and sewing bag. I have bought a spool of thread here, and I thought I might as well make myself comfortable and improve my time while waiting for my change."—*New York Weekly.*

POWERS OF THE FACTORY INSPECTORS.

There has been considerable grumbling indulged in from time to time by manufacturers and shop-owners in New York state when ordered by the Factory Inspectors to promptly put up proper safeguards for the employes at work in their buildings. Threats have been made that the law would be contested on the ground that it was unconstitutional to invest the Inspectors with such powers. Recently preparations were made to contest the law in Buffalo, but the law has been sustained and the demands of Inspector Connolly have been complied with. The Chief Inspector had brought suit against a Buffalo manufacturer to compel him to place automatic doors on the elevators of his factory. The manufacturer at first refused and defied the authority of the Inspector, but it is now announced that after taking legal counsel in the matter he has come down from his high perch and agreed to put in forthwith the safeguards demanded. The change of front on the part of the manufacturer is accepted as evidence that the constitutionality as well as the beneficence of the law is recognized by the best legal talent of the state, and the fact should be an encouragement to the working people in other states to agitate for a similar system of factory inspection, with power adequate to enforce its recommendations.

The efficacy of this department presents a very instructive contrast with the limited powers and consequent inefficiency of the State Board of Arbitration, for the discontinuance of which a strong movement is reported as being made by the officials of the Knights of Labor. It would seem much more consistent and practical to agitate for the powers of the Board to be increased rather than for its abolition, unless the Knights of Labor are prepared to reject the principle of arbitration, which was one of the basic principles of the Order in its beginning. They would be sustained by the working people of the state in a demand for an amendment to the law, but the abolition of the Board would not serve any good purpose for the labor interests, but on the other hand would enable the enemies of the principle of abitration to point to the fact and say that it has been tried and found wanting.

HEATING BY EXHAUST SYSTEM.

In the *Sanitary Engineer* "F. W. C." gives the following experience in heating by exhaust steam:

Reading the paper by C. W. Naylor, also the article in your July 4th number by Geo. Waters, has induced me to write my experience with exhaust steam. I am, what some would call a crank on exhaust steam heating, and it is a pity there are not more of them on this particular subject. Previous to my taking charge of this plant all the heating was done with live steam from 48 inch boilers, throwing away the exhaust of two high speed engines, one slow speed and a pair of elevator engines. The steam for these engines was furnished by two 60 inch boilers. In

the winter or through the heating season it required six boilers to do the work, four for heating and two for power. I first put the slow speed engine and elevator engines to heating, then came the high speed. While making the necessary changes, I was called a fool for thinking of making high speed engines run with five or six pounds back pressure. This did not discourage me in the least. I got the change made and started with eight pounds back pressure and to the surprise of the know-it-alls; they could see no difference in the working of the engines. The result was that we laid off three of the 48 inch boilers and one fireman. I was not able to carry out all my ideas, but did the next season, which was last fall. Having a much harder winter than the one before, gave me a good chance to test my changes. I investigated several grease extractors, and finally settled on one and put it in, this allowed me to return all my condensation back to the boilers. I put it on, so that all the exhaust passed through it before entering the feed water heater or the heating mains. I did away with all traps and brought all return pipes into one large pipe; from this I pumped; having arranged a governor to work my pump automatically, keeping a water line about one foot above the pump. I kept my returns sealed, not allowing my latent heat to escape through a vapor pipe; this enabled me to get my returns at a high temperature, 180° to 195°. By getting the returns back so hot it was very easy to raise the temperature of the water to within one or two degrees of the temperature of the exhaust steam, which was 228° to 230°, carrying from five to six pounds pressure; this gave me my feed-water at 226° to 228°. Will say here my heater is a 400 h. p. heater, heating about 175 h. p. of water. Meantime we had taken out the two high speed engines, which together were 86 h. p. and put in one slow speed engine of 160 h. p. capacity. We increased our work from 80 h. p. on the high speed engine to 130 h. p. on slow speed engine; thus doing 50 h. p. more work. After making these changes, it enabled us to do all of our power and heating with the two 60 inch boilers and one fireman, formerly done with six boilers and two firemen, enabling us to earn $7,000 more, with $1,000 less expense for coal, the salary of one fireman less and four boilers laying in reserve. Now, this is not any more than scores of other engineers can do in their plants if they will set about it. I forgot to mention that we reduced our water bills 75 per cent by this change.

A MODEL BUILDING ORDINANCE.

A committee was recently appointed by the American Institute of Architects, the National Association of Building Inspectors, the National Boards of Underwriters, and the National Association of Fire Engineers of the United States, to draft a model building ordinance for general adoption. The committee has considered the matter and reported that it is impossible to accomplish the task at present. They, however, recommended the adoption by the State Legislature of the following principles of safe construction as a basis for local legislation:

1. That all buildings over seventy feet in height be constructed throughout of incombustable materials, protected in the most approved manner for resisting fire.

2. That interior structural ironwork in all buildings be covered and protected by fireproof material.

3. That all buildings over fifty feet in height be furnished with permanent stand pipes and ladders for the assistance of the Fire Department.

4. That the height of buildings to be erected should not be more that two and one-half times the width of the principal street on which they are situated, and that no building, or portion of a building, except church spires, should be more than one hundred and twenty-five feet high, except under a special permit.

5. That the open floor-space, not divided by walls of brick or other incombustible material, in all buildings hereafter erected for mercantile or for manufacturing purposes, should not exceed six thousand square feet, without special permission, leased upon unusual and satisfactory precautions.

6. That every building to be erected, which shall be three stories high or more, except dwelling houses for one family, and which shall cover an acre or more than twenty-five hundred square feet should be provided with incombustable staircases, enclosed in brick walls, at the rate of one such staircase for every twenty-five hundred square feet in area of ground covered.

7. That wooden buildings, erected within eighteen inches of the line between the lot on which they stand and the adjoining property, should have the walls next to the adjoining property of brick; or when built within three feet of each other should have the walls next to each other built of brick.

8. That the owner of an estate in which a fire originates should be responsible for damage caused by the spread of the fire beyond his own estate, if it should be proved that in his building the foregoing provisions were not complied with. A certificate from the Inspector of Buildings shall be considered sufficient evidence of such compliance, if the building shall not have been altered since the certificate was issued.

PLUMBING NOTES.

Mention was made last week of a suit brought by the Goss Heating and Plumbing Company, of Kansas City, against C. T. Snow for the balance due for plumbing. The suit was decided against the Goss company on the grounds that the company had violated the anti-pool law, and an appeal was taken. The Goss company has claimed, so far, that it has not violated the anti-pool law because it has not observed the association's schedule of prices. In appealing it is possible that this will be the only question raised and that the violation of the law will not be tested. The constitutionality of the Missouri anti-pool law has been sustained by the "public policy" decisions in a number of other states. The general opinion seems to be that the law is sound. C. T. Snow, the defendant in the case, originally owed the Goss company $200 for plumbing. This account he lowered by various payments to $39.60, which amount the Goss company sued him for. Snow conceived the idea that he was being pushed with unseemly haste by his creditor, and placed the matter in the hands of Jones & Jones, attorneys. Jones & Jones set up the anti-pool law as an answer to the suit of the Goss company. The Master Plumbers' Association of Kansas City, of which the Goss company is a member, entered into an agreement December 11, 1888, to keep up prices for plumbing to a fixed schedule and to prevent wholesalers of plumbers' material selling to anyone out of the association.

Chapter 128 of the revised statutes of 1889 provided that any corporation or person who entered into a contract with others to keep up the prices of "articles of merchandise or commodity" or to regulate the supply of such articles should be deemed guilty of a misdemeanor. Section 5 of that chapter provided that any purchaser of any article or commodity from any individual, company or corporation, transacting business contrary to any of the provisions of the preceding sections of the chapter, should not be liable for the price or payment of such article or commodity, and might plead this chapter as a defense to any suit for such price or payment. This is the section pleaded by Jones & Jones and on which Justice Allen held the account of $39.60 appearing on the Goss company's books against Snow as null. This decision of Justice Allen practically declares every open account entered on the books of any member of the Master Plumbers' Association since December 11, 1888, void and uncollectable in a court of law. A sessions act of the last legislature went into effect June 24, 1891, that not only re-enacts the anti-pool law of 1889, but strengthens it. It provides for a fine of $100 a day to be assessed against a violator of this law. It requires officers of corporations throughout the state to send affidavits to the secretary of state July 1 of each year, stating whether they are violating the law or not. For refusal to make out this affidavit the corporation may be dissolved.

The master plumbers in Boston have refused a demand made by the journeymen for an advance in wages from $3.50 to $4 a day, and the demand will not be pushed.

Winnipeg plumbers have secured a nine-hour day and increase from $3.50 to $4 per day.

Mr. Robert Griffith, the efficient ex-president of the National Association, is taking a rest with his family at Fox Lake. He has moved his family to this pleasant resort and divides his time in the recreation found by the lake and in overseeing his plumbing business in the city. He occasionally runs in for a day or so, attends to business, and then returns to his family and the rest he

has fully earned. Mr. Griffith carried his prompt and systematic business methods into the executive office of the National Association and made a pronounced success from the start. He is now applying the same methods and care to his business, and none of his patrons need ever fear of slighted work at his hands. He has that sturdy honesty which makes good and safe citizens and restores the balance to the general confidence in mankind.

A housewife in Philadelphia delightedly says: Uptown housewife, delightedly: "I've got enough soap for all summer. Some grease got down the sink; then I poured soda and ammonia and other things down it; then a plumber only asked $1.50 for opening the trap and scooping out a beautiful ball of soap."

The increased water pressure from the new Camden standpipe is overtaxing old water-pipes, and plumbers are having a kind of picnic.

Notwithstanding the prevailing dullness along the lines of plumbing goods for the past month, the Stewart Ceramic Company, 323-5 Dearborn street, are gratified to report much interest shown in their Solid White Crockery Wash Trays and Sinks by the trade in general, and from the kindly disposition prevailing towards them, feel encouraged to anticipate a lively and rapidly increasing business in the near future. This concern believes in calling a spade a spade, and proposes to attract business by deserving it through courteous treatment, prompt deliveries, liberal dealing and the best goods in the market, home manufactured, at a less cost than anything in their class. Among the different locations where their wares have been put in use during the past weeks by local plumbers may be mentioned the following: Hotel, Mr. Arthur Kaye, Lake Geneva, Wis.; Mr. M. J. Roughan, plumber. Residence, Mr. O. W. Ballard, 3642 Prairie avenue, city; Mr. J. M. Collins, plumber. Residence, Mr. John Reimer, Drexel boulevard near Forty-third street, city; Mr. E. Baggot, plumber. Residence, Mr. J. Mason Loomis, Lake Shore Drive and Scott street, city; Mr. M. J. Corboy, plumber. Industrial School for Girls, Prairie avenue and Forty-ninth street, city; Mr. P. Nacey, plumber. Ceramic goods will also be used in the near future at: Addition Michael Reese Hospital, Groveland avenue and East Twenty-ninth street, city; Mr. Simeon B. Eisendrath, architect. Residence, Mr. A. L. Deane, 4420 Woodlawn avenue, city; Mr. Harry A. Black, plumber. Residence, Mr. A. M. Rothschild, Michigan avenue and Thirty-seventh place; Mr. L. B. Dixon, architect. Residences, five, Mr. George Otis, Oakenwald avenue between Forty-fourth and Forty-fifth streets, city; Mr. Harry A. Black, plumber. Residences, two, Mr. C. E. Follinsby, 4521-3 Ellis avenue, city; Mr. Harry A. Black, plumber. Residence, M. J. Roughan, Jackson boulevard and Oakley avenue, city. The sanitary appliances, plumbing work and fixtures throughout in this residence will probably be as fine as any in the country. The company's manufactures may be seen on exhibition at the stores of Mr. M. J. Corboy, 82 Dearborn street, city; Mr. Robert Griffith, 427 N. Clark street, city; Mr. P. Nacey, 339 Wabash avenue, city; Messrs. P. Sanders & Sons, 1314 Wabash avenue, city; The Walcott-Hurlbut Co., 203 Lake street, city; Messrs. Henry Huber & Co., 82 Dearborn street, city; at the Institute of Building Arts, 63-5 Washington street, city, and elsewhere. All interested parties will be made welcome to the warerooms of the company, 323-5 Dearborn street and 60-2 Plymouth place.

E. P. Reardon, of St. Louis, gave THE SANITARY NEWS a pleasant call last Wednesday and provided himself with good reading for one year. Mr. Reardon attended the Cincinnati convention, from which he took a trip through the east and at the time of his call was on his return trip. He had a long and pleasant journey and had a good time all round. He has looked around in Chicago and says that St. Louis plumbing is ahead of plumbing in this city, the plumbers are better organized and everything runs smoothly. On the 20th of this month the St. Louis plumbers will give their annual picnic, and those who have attended former picnics at that place know the good times awaiting them.

WHERE PLUMBING WORK IS BEING DONE.

118 Ambrose street, Nelson & Cederholm, 87 W. Ohio street.
1130 Adams street, W. G. Coles, 194 So. Western ave.
1202 Adams street, C. Lawrence, 1315 W. Madison street.
5438 Atlantic street, W. Metz, 342 Fifth ave.
596 Ambrose street, Steiner & McFarlane, 918 W. 21st street.
22 Burling street, G. A. Lawson, 272 57th street.
Belden ave. W. of Halsted street, Coolidge & Co., 223 E. Lake street.
Belden & Seminary aves., Gray & Culloton, 62 N. Clark street.
469-79 Bowen ave., M. Brooks, 1111 W. Harrison street.
Belmont ave. W. of Leavitt street, P. Jaeschke, 759 Clybourn ave.
1021 Baxter ave., C. Redieske, 99 Clybourn ave.
Bloom near 38th street, Steiner & McFarlane, 918 W. 21st street.
419 Chicago ave., O'Brien & Luder, 351 W. Chicago ave.
288 Cortland street, H. Breyer, Jr., 1706 Milwaukee ave.
627 Cornelia, C. Kostlevy, 218 W. Eighteenth street.
248-50 Clark street, R. Coleman, 855 N. Clark street.
2700 Cottage Grove ave., J. Teutsch, 2961 Wentworth ave.
Clinton near Wilson, J. Leibold, 311 W. Twelfth street.
6345 Carpenter street, J. Monahan, 1636 47th street.
292 Dalton street, George Groll, 886 N. Halsted street.
1413 Division street, C. E. Juergens, 1274 W. Madison street.
698 Dania ave., Harvy & Mose, 665 North ave.
3235 Deering street, Cotter & Son, 867 31st street.
2901 Dearborn street, W. Metz, 342 Fifth ave.
335 Dayton street, R. Coleman, 855 N. Clark street.
Dearborn N. of 61st street, P. K. Hardin, 3521 State street.
813 Diversey ave., James Scheuer, 737 Lincoln ave.
315 Erie street, Nelson & Cederholm, 87 W. Ohio street.
802 Eighteenth street, C. Kostlevy, 218 W. Eighteenth street.
80th street and Hamilton ave., Brunt Bros., 9115 Erie ave.
88th street and Buffalo ave., Brunt Bros., 9115 Erie ave.
Erie street bet. Wells and LaSalle ave., C. Redieske, 99 Clybourn ave.
Eighteenth street bet. Rockwell and Washtenaw, Steiner & McFarlane, 918 W. 21st street.
4206 Ellis ave., Mitchell & Bros., 48 43d street.
Eleventh near Ashland ave., H. S. Thompson, 201 E. Randolph street.
4206 Ellis ave., Mitchell & Bro., 48 43d street.
164 Frankfort street, H. Breyer, Jr., 1706 Milwaukee ave.
360 Fullerton ave., J. Scheur, 737 Lincoln ave.
3621 Forest ave., E. Hennessy, 3247 State street.
241 Forest ave., Garner & Bahn, 1740 Milwaukee ave.
265 Fairview ave., Garner & Bahn, 1740 Milwaukee ave.
290 Giddings street, John Dewald, 746 Southport ave.
3612-20 Grand boul., A. W. Bensinger, 173 31st street.
Glenwood ave., O'Brien & Luder, 351 W. Chicago ave.
Garfield ave. W. of Robey street, G. Hausline & Son, 1197 N. Halsted street.
Glenwood and Augusta street, O'Brien & Luder, 351 W. Chicago ave.
57 Grant place, E. Sheehan & Co., 222 Illinois street.
7109 Greenwood ave., F. Murphy, 6810 S. Halsted street.
62 Gardner street, C. Redieski, 99 Clybourn ave.
Geraldine ave. near Irving Park, S. Dietcher, Milwaukee ave. N. of Lawrence ave.
Hoyne ave. N. of Addison street, J. Dewald, 746 Southport ave.
1699 Halsted street, George Tipple, 689 Lincoln ave.
530 Hoffman ave., Garner & Bahn, 1740 Milwaukee ave.
276 Harvey street, H. Breyer, Jr., 1706 Milwaukee ave.
394 Huron street, O'Brien & Luder, 351 W. Chicago ave.
1427 Harvard, J. Liebold, 311 W. Twelfth street.
1525-27 Harrison street, M. C. McDonald, 383 Ogden ave.
Homan ave. near Sixteenth street, J. Keeney, 645 Blue Island ave.
701 Jackson street, G. Hills, 680 W. Van Buren street.
723 Jane street, Bowman Bros., 687 W. Chicago ave.
73 Jansen ave., Buckhardt & Tomlinson, 942 N. Clark street.
444 Jackson street, J. H. Sullivan, 328 E. Division street.
Jackson ave. and 97th street, A. L. Thompson, 9138 Erie ave.
815 Leavitt street, Wilson & Wilk, 1158 Milwaukee ave.
Lincoln street, bet. 45th and 46th street, C. Kostlevy, 218 W. Eighteenth street.
3461 Lowe ave., J. Teutsche, 2961 Wentworth ave.
Leavitt street and Station, J. J. Hamblin & Co., 348 S. Robey street.
302 Loomis street, J. Breen, 373 W. Van Buren street.
4315 Langley ave., Murphy & Voight.

630 Larrabee street, R. C. Miller, 871 W. North ave.
Lake ave. near 53d street, J. & B. Rourke, 5434 Lake ave.
Laflin street near Twentieth, J. Keeney, 645 Blue Island ave.
1164 Milwaukee ave., Wilson & Wilk, 1158 Milwaukee ave.
Michigan ave. bet. 67th and 68th street, L. Levy, 4009 State street.
Mozart and Byron streets, H. Breyer, Jr., 1706 Milwaukee ave.
67 Myrtle ave., J. J. Hamblin & Co., 348 S. Robey street.
Milwaukee ave. near Franklin street, S. Dietscher, Milwaukee ave. N. of Lawrence ave.
189 Milwaukee ave., Love & Welsh.
22 Newton street, O'Brien & Luder, 351 W. Chicago ave.
106 Nebraska street, J. Liebold, 311 W. Twelfth street.
Osgood street, bet. Belden and Webster aves., G. Hausline, 137 N. Clark street.
Oakdale ave. W. of Halsted street, J. Schier, 737 Lincoln ave.
557 Oakley ave., J. Liebold, 311 W. Twelfth street.
Oglesby ave. N. of 61st street, Bowden & Co., 81 Dearborn street.
288 Ohio street, Nelson & Cederholm, 87 W. Ohio street.
371 Paulina street, W. Daniels, 406 Western ave.
3233 Parnell ave., Sherman & Bennett, 2515 S. Halsted street.
Polk street and Centre ave., R. J. Powers, 88 LaSalle.
Peoria and Fulton streets, O'Brien & Luder, 351 W. Chicago ave.
513 Polk street, J. H. Shannon, 273 Blue Island ave.
Park and Lincoln aves., J. H. Sullivan, 328 E. Division street.
157 Rhine street, T. Foley, 646 Noble street.
444 Robey street, O'Brien & Luder, 351 W. Chicago ave.
Racine near Webster aves., P. Jaescheki, 759 Clybourn ave.
217 Rumsey street, O'Brien & Luder, 351 W. Chicago ave.
79th place, E. of I. C. R. R., G. A. Larson, 275 57th street.
School street W. of track, J. M. Dewald, 746 Southport ave.
703 Seymour ave., Harvy & Mose, 665 North ave.
112 Sheffield ave., John Lenz, 357 Larrabee street.
4412 Sherman street, B. A. Finn, 136 35th street.
124 Stave street, Garner & Bahn, 1740 Milwaukee ave.
820 Spaulding ave., Dornbos & Bros., 573 W. Eighteenth street.
472 Superior street, O'Brien & Luder, 351 W. Chicago ave.
76th street and Jefferson ave., Cook & Mangan, 1802 Wabash ave.
79th place, G. A. Lawson, 275 57th street.
5313 School street, W. Metz, 342 Fifth ave.
5606 Sherman street, J. Evans, 4401 Dearborn street.
Stony Island ave. and 68th street, F. Murphy, 6810 S. Halsted street.
75th and Brooks ave., Cook & Mangan, 1802 Wabash ave.
65th street and Maryland ave., J. Emblem, 236 31st street.
1036 31st street, Cotter and Son, 867 31st street.
Troy and Huron streets, Gay & Culloton, 62 N. Clark street.
Thomas street W. of Hoyne ave., Dornbos & Bro., 573 W. Eighteenth street.
3670 25th street, Nash & Harna, 2216 Wabash ave.
423 Thirteenth street, Love & Welsh.
1146 Twelfth street, Baggot & Son, 2135 Michigan ave.
Taylor street. W. of Ashland ave., Becker & Co., 483 S. Halsted street.
Twentieth and Loomis streets, F. Meek, 485 W. Eighteenth street.
22d street, bet. Whipple and Albany ave., Steiner & McFarlane, 918 W. 21st street.
140 25th Place, J. H. Kilian & Co., 333 22d street.
647 Washburne ave., Baggot & Son, 2135 Michigan ave.
Wilcox ave. W. of Driving Park, John Connell, 235 W. Harrison street.
5533 Winter street, T. B. Bryson, 6335 Wentworth ave.
486 Wood street, Harvy & Mose, 665 North ave.
Wright ave. bet. 74th and 75th, E. Bradley, Vincennes ave. N. of 103d street.
Wallace and Avondale streets, Garner & Bahn, 1740 Milwaukee ave.
Wrightwood W. of May street, G. Hauslein & Son, 137 N. Clark street.
Western and Diversey aves., P. Jaescheki, 759 Clybourn ave.
61 and 138 Willow ave., H. Bauer, 232 E. North ave.
16 Werder street, O'Brien & Luder, 451 W. Chicago ave.
189 Wilcox ave. C. S. Lawrence, 1315 W. Madison street.
291 Wabansia ave., C. F. Klentz, 552 Elston ave.
Watson and Winter streets, C. J. Boyd, 805 47th street.
4711 Winter street, C. J. Boyd, 805 47th street.
4440 Wallace street, C. J. Boyd, 805 47th street.
6217 Wentworth ave., Murphy, 6810 S. Halsted street.
84 Western ave., Harvy & Mose, 665 North ave.
6322-24 Wright street, J. Conraths, 5902 State street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: C. S. Frost has let contracts for a 6-story store and office building, to be built at Rockford, Ill., for the William Brown Company. It will be heated by steam and provided with passenger elevators; cost, $100,000. S. S. Beman is engaged in the preparation of plans for a 6-story Y. M. C. A. building, 88x88, to be built at Grand Rapids, Mich. The interior will be finished in hardwood and heated by steam; cost, $60,000. Emmons & Colestock have planned a 2-story and basement club house, 34x79x100, for the Woodlawn Park Club, to be built at Woodlawn, Ill. The exterior will be constructed of pressed brick and stone, and the interior will be handsomely finished in hardwood and heated by steam; cost, $25,000. Esbrooke & Burnham have designed a 3-story building to be built at Effingham, Ill., by Calvin Austin. It will be constructed of stone and brick, with handsome interior finish and will be heated by steam; cost, $25,000. They have also designed a barn for the same person. For Frank H. Ray they have designed a store and opera house, to be built at Meredosia, Ill. Pressed brick and stone construction; cost, $20,000. For a Roman Catholic Society at Boise City, Idaho, they have designed an academy; also an observatory and music hall, to be built in connection with St. Mary's Academy at Notre Dame, Ind. For William M. Hoyt & Co. they have designed a 4-story barn and flat building, 50x100, to be built on Illinois street, near St. Clair. Brick and stone construction; cost, $20,000. For Guy F. Casman they have planned a $6,000 residence, to be built at Kenilworth, and for M. Foley they have designed a $5,000 residence, to be built at Evanston. For William B. White they have designed a 2-story barn, 30x50, to be built in the rear of his residence on Grand boulevard near Boulevard Place; cost, $6,000. Wilson & Marble have designed six 3-story dwellings, to be built on the east side of Drexel boulevard, between Forty-first and Forty-second streets, by F. B. Clarke. They will be constructed of stone, with hardwood interiors, and will be heated by steam; cost, $72,000. Perley Hale has designed a hotel and tower, to be built at Sixty-fourth street and Stony Island avenue by the Park View Hotel Co. The hotel will be seven stories, 160x125, and above this a tower will extend, the total height of which will be 533 feet. Pressed brick and stone will be used in the construction of the hotel, and the tower will be constructed of steel; cost, $800,000. The same architect has designed a 3-story flat building, 25x60, to be built on Forty-first street, east of Grand boulevard, by Mrs. Alice Aird. The front will be constructed of stone, and the interior will be finished in hardwood; cost, $10,000. George H. Borst has planned a 2-story residence for H. Corr, to be built at Cuyler; cost, $6,000; also for C. F. White a 2-story stable, 47x30, to be built on Woodlawn avenue, between Forty-sixth and Forty-seventh streets; cost, $4,000. For M. F. Kellogg he has planned a 3-story and basement flat building. It will be constructed of pressed brick and stone; cost, $10,000. Sprague & Newell have designed a 3-story and basement residence, 118x112, for O. H. P. Baxter, to be built at Pueblo, Cal. It will be constructed of rock-faced granite, with Spanish tile roof and beautiful interior finish; cost, $150,000. For the same owner and at the same place, a 2-story stable of granite; cost, $20,000. For W. F. Kroll, at Pueblo, they have planned a 3-story dwelling of pressed brick, plate roof and hardwood interior; cost, $30,000. They will also plan a 5-story business block, to be built there at a cost of $125,000. For the Illinois Hotel Co., of Chicago, they have designed a 6-story hotel, to contain 780 rooms. Kley & Lang have designed a 3-story and basement flat building for M. Bodeker, to be built on Vernon Park Place; stone construction; cost, $9,000.—Philadel-

phia, Penn.: Camden will soon have a handsome edifice at Fifth and Market streets. The Masonic Temple Association has secured the land and will have the structure under way as soon as possible. The building will cost $70,000. Eight architects are now preparing plans for the proposed temple, which will be four stories high with a score of offices and a large auditorium. A 2-story machine shop, 40x40, will be erected on the west side of Carlotta street, south of Girard avenue, by John F. Greene. Architects Moses & King have the plans for a hotel, to be erected at Budd's Lake, N. J.; an office building for the People's Bank, of Wilkesbarre; a store to be built at Moorestown, N. J., for Matlack & Harrington, and a dispensary, to be erected by the authorities at Camden. Architect Wilson Eyre, of this city, has prepared the preliminary drawings for a club-house to be erected at Detroit. The contract for the erection of a temple at Broad street and Montgomery avenue for the Reformed Congregation Keneseth Israel, has been awarded to William W. Rea & Son, the builders, of 1815 Francis street. The structure will cost about $100,000. James D. Arthur has been awarded the contract for the erection of a 2-story stone chapel, at Forty-seventh street and Kingsessing avenue. Seventeen dwellings will be built at Hellen and Somerset streets by John J. Torpey, the builder. Joseph M. Dotterer will erect a stone building, 20x40 at the southwest corner of Ridge avenue and Minerva street. J. W. Fitzinger will erect a mill at the foot of Collon street, 45x263. This structure will occupy the site of a smaller mill recently destroyed by fire. At the northeast corner of Roschell avenue and Freeland street, two 3-story houses of artistic design will be erected by Charles E. Bartel, the contractor. A large office building will be erected at Joplin, Mo., after plans drawn by Thomas P. Lonsdale, of this city, who is engaged upon the plans for a residence to be erected at Nicaragua, of materials shipped from this country. Charles Balderston is designing a magnificent house for a California millionaire.——Cincinnati, Ohio.: J. H. Kuckertz has plans for a residence to be erected at Norwood, O., for Joseph Mersch, 95 St. Clair street; cost, $6,000. Baude & Kunz have plans for a residence for Chas. W. Wocher, Seventh and Main streets. To be two and a half stories; cost, $7,000. G. W. Drach has plans for a residence for Louis A. Roth, 58 West Fourth street. To be built of brick, with stone foundation and trimmings; cost, $5,000. L. Plympton has plans for a brick residence to be erected at Walnut Hills for Mrs. Rose Bussing, Myrtle avenue; cost, $4,000. The same architect has plans for a stone residence for Walter Fisher, 261 Walnut street. To be two stories high; cost, $7,000.——San Francisco, Cal.: M. J. Wood's plans were accepted for the handsome opera house and business block in Stockton to cover 150 square feet; cost, $200,000. The building will be four stories high and will be built by the Yosemite Opera House Co. J. J. Clark has completed plans for a 2-story frame residence on Dora, near Harrison street, for Thos. McBride; cost, $20,000. McDougall & Son have completed plans for two 2-story frame dwellings on the south side of O'Farrell, between Polk and Van Ness avenue for Mr. and Mrs. Bridgeman; cost, $12,000.——Washington, D. C.: Von Nerta made the plans for the apartment house that Dr. Gregory and others will build at Oregon and New Hampshire avenues. It will be a 5-story structure, 50x110 and will cost upwards of $50,000. L. E. Dessez has made plans for a number of new structures that will be erected on the grounds of the new Naval Observatory. The most important is a dwelling for the use of the superintendent. It will be two stories, basement and attic, 40x80. R. E. Crump has made plans for a carriage house that will be built as an addition to the Mt. Vernon stables on Twelfth street, between M and N streets. It will be two stories, 52x57, with front of select red brick, trimmed with Hummelstown brownstone. J. H. Duvall will improve D street, southeast, between Fourteenth and Fifteenth streets, by the erection of a block of thirteen dwellings. They will be two stories, 16x45, with fronts of red brick and Ohio stone. They will cost $26,000. The Garfield Hospital is soon to be enlarged by the addition of a 4-story building. It will be 32x85 with a front of brownstone and select red bricks. The cost will be $20,000, and A. P. Clark, Jr., is the architect. Mr. J. H. Merriwether will soon commence the erection of a dwelling on Third street, between N and O streets, northwest, from plans now being prepared by N. T. Haller. It will be 17x64, two stories and cellar, with a front of Hummelstown brownstone and pressed brick. The cost will be $3,000.——Milwaukee, Wis.: John Paulus has plans for a store building to be erected corner First avenue and Mineral street for Kroeger Bros. To be 43x100, of pressed brick, with stone foundation and trimmings; cost, $7,000. Ferry & Clas have plans for a dwelling for R. L. Jones. To be 28x54, two stories, built of common and pressed brick; cost, $4,500. B. Kolpacki has plans for a dwelling and store for Fred. Brand. To be 28x60, built of common and pressed brick, with stone foundation and trimmings; cost, $7,000.

HEATING AND LIGHTING.

New electric light plants or extension of those already existing are reported as probable in the following places: Suisun, Cal.; Quanah, Tex.; Louisville, Ky., address A. Barth; Franklin, Va., address W. W. Moore; Hillsboro, Tex.; Wheeling, W.Va., address N. E. Whitaker; Connellton, Ind.; Ishpeming, Mich.; Plymouth, N. H., address M. A. Ferrin; LeRoy, Fla.; Stanford, N. Y.; Pioche, Nev. The following electric light companies have been recently incorporated: Electrical Engineering Co., Chicago, Ill.; capital stock, $50,000; incorporators, R. H. Pierce, G. W. Seymour, F. K. Baggs. Light, Heat & Power Co., New Albany, Ind.; capital stock, $50,000. Merchants' Electric Light Co., Leavenworth, Kan.; capital stock, $50,000. Citizens' Light & Power Co., Seattle, Wash.; capital stock, $50,000; incorporators, A. E. Braymer, W. H. White, R. W. Emmons. Penacook Electric Lighting Co., Concord, N. H.; capital stock, $10,000; incorporators, C. H. Landers, E. H. Brown, G. W. Abbott and others.——Wakefield, Mass.: A municipal electric light plant is to be established here.——San Jose, Cal.: The Electrical Improvement Co. has increased its capital stock to $1,000,000, and will make extensive improvements in the present system. An all day incandescent light service will be put in.——Loveland, Col.: The local authorities are considering the establishment of an electric light plant.——Brownton, Ohio: An electric lighting plant is to be established at this place.——Hillsboro, Tex.: The City Council has decided to establish an electric light plant.

SEWERAGE NOTES.

Lawrence, Mass.; Petitions have been made for sewers on several streets.——Salem, Mass.: A 46-inch sewer, estimated to cost $18,000, has been recommended.——Goshen, N. Y.: A petition for a sewerage system is being circulated.——Port Jervis, N. Y.: Sewer bonds to the amount of $50,000 have been sold.——Ypsilanti, Mich.: The city has been divided into two districts and a committee appointed to receive bids for putting in sewers.——Missoula, Mont.: Many additional sewers will be constructed.——Denver, Colo.: Sewers have been recommended in several streets, over 1½ miles of 12 to 24-inch pipe and about ½ mile of 2½ to 4-inch pipe.——Haywards, Cal.: Sewers and a sewage farm are being discussed.——London, Ont.: A report on a sewage farm has been made by Willis Chapman, Toronto, to cost about $90,000.——Palmer, Mass.: Engineer J. J. Van Valkenberg has completed plans for a line of sewers at this place.——Tallaposa, Ga.: It is reported that a party of New York capitalists are about to establish a sewerage system at this place.——Chicopee, Mass.: Sewer main extensions are to be made at this place.——Willimantic, Conn.: The local officials have authorized the construction of numerous additional sewers at this place.

WATER WORKS NOTES.

Pittsfield, Me.: The Pittsfield Water Works Co. has been organized with James F. Connor, Secretary.——South Berwick, Me.: H. W. Burgett is at the head of a company which proposes to build works.——Attleborough, Mass.: The district has voted to establish and operate a pumping plant.——Easthampton, Mass.: The works will be extended and improved.——Dryden, N. Y.: Estimates for works will be made at once and a vote on the subject taken.——East Greenville, Pa.: It is reported that works are to be built.——Stroudsburg, Pa.: The people will soon vote on the construction of $40,000 works.——Thompson, Pa.: The Thompson Water Co. has been incorporated with a capital of $5,000.——Asheville, Pa.: It is proposed to put in a new pump, force main and a 12,000,000 gallon reservoir.——Macon, Ga.: The Gas, Light & Water Co., will spend $300,000 in improving the gas and water works.——Alliance, Ohio: There is talk of a

new water works system.——Elwood, Ind.: The Elwood Water Co., has been incorporated with a capital of $100,000.——Centralia, Ill.: It is believed that a new water company will be formed to build the proposed works.——Pontiac, Ill.: J. H. Hainsworth, of Franklin, Ind., has the franchise for works. Bids for material, including a 15x125 feet stand pipe and five miles of mains will soon be wanted.——Springfield, Ill.: D. C. Cregier will report on an increased water supply for the Springfield works. A new force main is under consideration.——Castle, Mont.: Gravity works will be built at once by a company at an estimated cost of from $48,000 to $60,000. Address James King, Helena, or H. H. Barns, Castle.——Honey Grove, Tex.: The Honey Grove Artesian Water Co. has been incorporated by W. D. Wilkins and others; capital $20,000.——Mt. Vernon, Wash.: J. M. Turner has applied for a franchise to put in works estimated to cost $40,000.——Santa Rosa, Cal.: Direct pumping city works are under consideration. ——Toronto, Ont.: The Lieutenant Governor has approved the by-law authorizing the city to borrow $184,723 for the extension of mains and for meters.——Wiarton, Ont.: The works will be extended at a cost of $5,000.——West Union, Ia.: It has been decided to establish a system of water works at a cost of $20,000. ——Hannibal, Mo.: The question of establishing a municipal water works system is being agitated. Address Mayor Albertson. ——Nappanee, Ind.: Works will be built at a cost of $10,000.—— Belton, Tex.: H. A. Ware and others will build works to cost $30,000.——Washington, Ia.: A complete system of water works will be put in at a cost of $40,000.

BIDS AND CONTRACTS.

Winnebago City, Minn.: Bids will be received by the Council until August 17, for water works, including a pump and two miles of mains, with hydrants and specials. W. Z. Haight is Mayor.—— Essex, Ont.: Bids for building water works will be received until August 12, by John Milne, Mayor. John Galt, Toronto, is consulting engineer.——Ypsilanti, Mich.: Bids are invited for the construction of a sewerage system.——Missoula, Mont.: Bids will be asked for the construction of sewers in several streets.—— Schenectady, N. Y.: Bids for street lighting are wanted.—— Cleveland, Ohio: Proposals are open until August 12, for building sewers in five streets. Address R. R. Herrick, Director of Public Works.——Springfield, Mo.: Bids will be received until August 11, for constructing a complete sewerage system. Address C. P. Johnson, City Engineer.——Austin, Tex.: Sealed proposals will be received until August 22, by A. P. Wooldridge, Secretary of Board of Regents at the University of Texas, for the erection of a steam heating plant for the University.——Gainesville, Fla.: Proposals are wanted until September 1, for the construction of a complete system of water works. Address A. J. McArthur, Chairman of Water Supply Committee.——Grand Forks, N. Dak.: Proposals are invited until August 15, for 27,000 feet of pipe sewers. Address C. A. Hale, City Auditor.——Eaton, Ohio.: The Trustees of Water Works will receive bids until August 18, for the construction of a complete system of works. John W. Hill, of Cincinnati, is Engineer.——Dartsmouth, N. S.: Proposals are wanted until September 1, for the construction of a system of water works. Address Mayor Frederick Scarfe.—— Winnebago, Minn.: Proposals are invited until August 17, for the construction of a complete system of water works. Address S. T. Conklin, Recorder.

A NEW TRAIN.

To the Pacific Coast, equipped with Pullman and Colonist Sleepers, has just been placed in service by the Northern Pacific Railroad, leaving St. Paul every morning at 9 o'clock. The "Fast Train" via the Wisconsin Central Lines, composed of Pullman Vestibule Drawing Room Sleepers, Dining Cars, and Coaches of latest design, leaving Chicago daily at 5 p. m., makes close connection in the Union Depot, St. Paul, with this train, affording excellent service to all points West.

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For tickets, berths in Pullman or Tourist Sleepers, etc., apply to George K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Harrison Street and Fifth Avenue Chicago, Ill.

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BOUND VOLUMES.

A few complete sets of The Sanitary News, from the first issue, are still left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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We have read a paragraph or so about a certain individual in Kansas City, Mo., who has formed a company for the purpose of laying pipes through which cold air is to be furnished dwellings to cool the rooms, freeze ice in refrigerators, and to do all this at a much lower cost than ice could be purchased. The scheme is not impossible, and when it is completed we would like to see a tunnel run to Chicago and a cool breeze wafted underground this way, not that Chicago is not cool enough, but because it would be so pleasant to sit in rooms thus provided with fresh air with the smoke shut out. We do not know the limit of the man's genius, but we hope it is lofty and far-reaching enough to blow the smoke clear out of Chicago and leave the buildings standing. We don't want a sure-enough cyclone or a tornado; an ordinary Kansas zephyr will do and be welcomed if it has a natural antipathy for smoke. But we do not know what would be the result of a conflict between Chicago smoke and a Kansas cyclone. We have heard of the bull that attempted to butt a locomotive off the track and have some fears for the safety of the cyclone.

A new career for women, says an exchange, is suggested by the fact that a lady sanitary engineer is now practicing in London. She appears to be a lady of varied knowledge, as she has received certificates for music, art, hygiene, divinity, physiology and sanitary science. She is a lecturer on domestic economy and hygiene at the Wordsworth College, London, and it is said gives learned discourses on the same subjects at the meetings of the National Health Society. This lady of versatile genius is Miss Scott, and she has been chosen to represent the women of England at the forthcoming International Congress of Hygiene, and will read a paper there. Miss Scott states: "I have visited slaughter-houses, workshops, dairies, and all manner of places in order to get information, and have learned all that I possibly can about plumber's work. Of course I understand, too, all about the laying of drains, water mains, connections, and so on. I have had an application to examine and survey the drainage of a house in Hampstead. I expect I shall have to draw up a plan of the whole sanitary arrangements." There is nothing out of the way in women becoming sanitary engineers. When ability in this direction is applied to domestic sanitation, and women more generally become informed on the subject, the result will be more homes in a state of healthfulness. Women in Chicago have made excellent inspectors, and their natural tendency toward cleanliness adapts them to sanitary work. Whatever women may find to do in a professional way with sanitary engineering, she can find a broad and inviting field for labor in securing the sanitation of her household. Many could become engineers, and very many more could become housewives fitted for the proper care of the home.

NEGLECTED PLUMBING.

A bit of history regarding the Institution for the Deaf and Dumb of Columbus, Ohio, will show the necessity of good plumbing and the danger of delay in the matter. Recently the trustees of this institution called upon the Deficiency Commissioners consisting of the Governor, Auditor of State and Attorney General, and obtained permission to create a deficiency of $1,606. This money is to be used in carrying out a part of the recommendations of the State Board of Health made abont a year ago. After an examination the Board recommended the abandonment of the old well under the engine room from which the water supply of the institution is taken, and a complete change in the system of plumbing. This was regarded as necessary to the health authorities in order to prevent an outbreak of disease, but the institution managers did not look upon the matter in exactly the same light, and were to some extent in different. They asked the Legislation for an appropriation of $2,600 to improve the plumbing, but omitted any reference to the condemned well. They were given $1,000, and this apparently satisfied them.

Recently a child of the Steward was attacked with diphtheria, and after being removed from the institution others contracted the disease. In the first instance the disease proved fatal. After this occurrence the Asylum authorities concluded to follow the recommendations of the Health Board, and applied for permission to create the deficiency, with a view of completely overhauling the system of plumbing, which was in a most dangerous condition.

It is a sad commentary on the judgment of officials to note that they have to be confronted with disease and death before they will discharge their duty. Taking this case in connection with the fact that there is no provision for plumbing inspection in that city, and that any incompetent plumber can do any kind of defective work, we are presented with a state of affairs little less than criminal. When we find the same state existing in other cities resulting in disease and death, disregarding all the best thought of the age and the demands of advanced hygienic laws, we are compelled to conclude that something is morally and fundamentally wrong with our municipal governments. One thing is sure: The citizens are sleeping on their rights while politicians and scheming men are preying upon them in matters of the highest importance.

In this neglect of plumbing in a public institution one life was sacrificed and several cases of sickness resulted. What is the difference between this and criminal negligence. If any citizen had torn down his own house and thrown a portion of a wall on an individual from which death resulted, he would have been indicted for murder. Yet here is a case from which death resulted from negligence more serious, and little is said about it. The results of this negligence are the same, and the same law should govern. The severest means possible should be employed to procure perfect sanitation in all public institutions and private dwellings as well.

THE VALUE OF PLUMBING ORDINANCES.

The master plumbers of Brocton, Mass., are trying to get through the City Council plumbing ordinances providing for the regulation and inspection of plumbing. They find it a difficult work on account of the opposition met with in the council. This has been the experience of all attempts to procure the proper regulation of plumbing. In some cities it has taken years to obtain the desired result, and in others many years of hard work have proved in vain. We do not know how to account for this opposition unless it is based in the want of a proper knowledge of the nature of plumbing and of what plumbing work and material really are. We have laws governing the practice of medicine, of law, of teaching, pharmacy and other pursuits, but when the subject of regulating plumbing by law is mentioned, the keen edge of opposition is felt. If this is not the result of dense ignorance regarding the importance of good plumbing, we must confess that we do not know to what this opposition must be ascribed. Those ignorant of the nature of plumbing and its relation to health, consider it as one of the mere mechanical arts and class it with blacksmithing. They do not know any better and are a full lifetime behind the age in which they live. Blacksmithing does not need any special legal regulation, and they can see no more in plumbing requiring it to be done under legal restrictions.

If plumbing were nothing more than a mechanical trick or the result of mechanical training, then such reasoning would apply. But plumbing is more. It is all the mechanics of it implies and all that the scientific knowledge of it demands. A plumbing job may be made mechanically perfect and yet be wholly defective in its relation to the proper sanitation of a building. Its nature is such that the health of the home depends on the character of the plumbing. If the refuse of a family were left in the house for a short time, it would soon become not only offensive but sickening. Defective plumbing does not remove the ill effects of this refuse from the house. It may be able to get it out of sight, but it provides avenues through which will enter all the foul and poisonous gases that arise from it. It will do more than this. It will open up to one household all the poisons that arise from many. Defective plumbing may be put in a house and that house left vacant, clean and new, and yet in a short time every corner of it will become infected with the foul gases in the sewer rising from the wastes of surrounding houses.

Another danger is presented by defective plumbing. A house may be plumbed in accordance with the very best practices, and every part be perfect, and yet that dwelling may not escape the evils arising from the defective plumbing of surrounding houses. A city may have its full share of honest, reputable plumbers who do their work properly, and yet through the fraudulent and incompetent work of a few irresponsible plumbers the whole city is endangered. Cases are of record where fatal epidemics have resulted from defective drainage of a single house. One poorly plumbed dwelling may be the means of spreading throughout the city a contagious disease. It has been the case and may be again. The protection from such dangers lies in the proper regulation of all plumbing work.

Human nature is said to be human nature the world over. Bad and incompetent men can be found in all trades and walks of life and the plumbing profession is not an exception to the general rule. There are so-called plumbers doing plumbing work who need the compulsory effects of legal enactments to compel them either to do good work or quit. This is all that is required. Some standard for plumbing must be set up, care being taken that it meets the requirements of sanitary science, and then laws must be passed compelling all plumbing to be done in accordance with the rules and regulations established. It is not legislation for a few or a class, but legislation for the public. Experience has long since taught us that this is a public necessity relating as it does to the highest public good. It seems that a subject so well settled and so widely accepted would not need further discussion, but we fear that some officials do not understand because they will not. In many cities there are political rings and cliques who seem to think that public offices were created especially for them, and that city governments were established to aid them in working out some selfish end or ambitious scheme. They give little heed to the best interests of the people so long as that interest is not necessary for their own gain. Cities have grown so bad in this regard that the people have risen in force to oust the offending officials. A better plan would be for the citizens to correct the evils however small as they appear. A refusal to enact plumbing ordinances, when everything points out their necessity so clearly, is a just cause for suspicion regarding the honorable intentions of city councils. We do not say this is the case in Brocton but state it as a general proposition. At any rate such ordinances have failed before the same bodies which have passed ordinances objectionable and offensive to every sense of justice and right—so clearly so that the charge of jobbery and "boodling" has been laid at their door. Aside, however, from all this the legal regulation of plumbing work stands on its own merits. It is founded in reason and long experience. It is no fine spun theory but a practical demonstration that cannot be put down.

NOTES AND NEWS.

A trail two years ago of Russian and Stettin Portland cement showed the tensile strength of each, in pounds per square inch 3000 to 4500 and 5250 respectively. The trial was made at Moscow.

The Kentucky State Board of Health has resolved to make a list of medical colleges whose diplomas are to be endorsed for registration, including those colleges only that in the future exact a matriculative examination and a three years' graded course.

An English court has lately imposed a fine of $750 upon a landlord for heedlessly stowing guests away into damp beds, thereby causing illness.

A special committee appointed by the American Medical Association will petition the next Congress to appoint a medical cabinet officer, to be known as the Secretary of Public Health.

Two cases are related in a late number of the *Medical News* in which severe poisoning, and in one case, with nearly fatal effect, followed the taking of nutmeg in large doses.

A street-railway sprinkling car is said to be under construction by the Minneapolis Street R. R. Co., to sprinkle the track along the electric line between St. Paul and Minneapolis.

The Colorado Lake promises to be permanent unless something is done to check the flow from the Colorado River. Explorers say that should the channel be cut a little deeper the water from the Gulf of California would find its way into the desert. These explorers report, however, that all the breaks and crevasses along the Colorado could be closed by sheet piling.

The Massachusetts law requiring the use of fenders on street cars, of such form as the State Railroad Commission should require, has been repealed. In their last report the Commission asked for the repeal of the law, not because fenders were not

needed, but because it was impossible to prescribe an efficient fender unless control could also be had over the roadway between the rails and over the type of car used.

A calcined infusorial earth filter has been invented by Mr. Barkefeld, a German engineer. It is made of fossil-meal or diatomaceous earth, and in the form of a hollow cylinder. Careful investigation shows that the cavities occupy about 65.7 per cent of the bulk, and each pore is filled with very fine spiculæ crossing each other. As it is a very bad conductor of heat, it has to be put into cold water and then have this water raised to the boiling point when it is desired to sterilize it. It will yield a desirable filtered water at the rate of about ½ gallon per minute, and by mechanical cleaning can always be restored to its original condition. It is claimed that its rate of filtering is far in excess of any house filter that can really produce water free of germs.

THE DEFECTIVE APPLICATION OF THE FRESH AIR INLET TO THE HOUSE DRAIN.

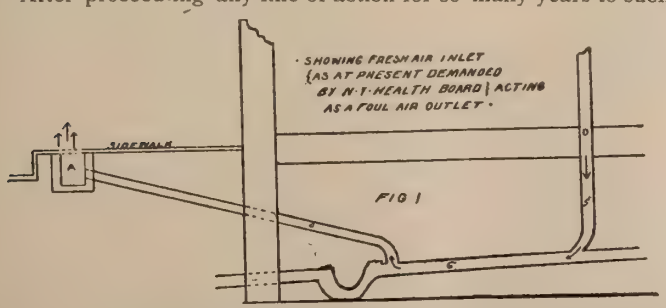
Mr. Leonard D. Hasford, a noted plumber and a writer of much note on sanitary subjects, of New York City, has an article in *Architecture and Building* for August 1, on the above important subject. His observations relate to plumbing in New York, but are of interest in other cities. We reproduce the article and illustrations so that it may reach a large number of plumbers who are interested in all matters of this kind, and hope to receive the opinion of some in regard to the matters discussed We believe discoveries, inventions, and suggestions of this character should meet with general consideration, for the plumbers of this country are striving for the best means to render plumbing safe and in all respects sanitary. We believe the suggestions by Mr. Hasford in regard to the fresh air inlet are new as illustrated in Fig. 2. If it will accomplish the results claimed it is an important improvement, and we would be pleased to have the opinions of our readers regarding it. Following is the article:

Passing through a cross street running east and west between Third and Sixth avenues in this city, on Murray Hill, a few days since, an examination was made by the writer of the fresh air gratings covering the "foot vents" or fresh air inlets to the house drains, with the result that out of seventy-six examined forty-eight were positively stopped to the utter exclusion of air passage thirteen were partially filled up; while in one instance where the grating had probably been broken, the opening in the flag had been neatly fitted with a piece of blue stone securely cemented in position by some one who evidently had never heard of a fresh air inlet.

This street is, no doubt, a fair average of the streets of New York, taken as a whole, although the tenement and warehouse districts are possibly even worse from the more rapid accumulation of filth on the sidewalks.

The above would seem to indicate that about eighty per cent. of the fresh air inlets, where placed on a level with the sidewalk near the curb, are inoperative. In addition to this it is reasonable to believe that out of the remaining twenty per cent.—which may be clear in fair weather—nearly all of these are totally closed during snow or ice storms in the winter, while water and slush run down in the little brick box built around the mouth of the pipe, and freezing, so remains all winter.

After prosecuting any line of action for so many years to such



an extent, it would seem as if some change should be adopted in the interests of good plumbing which would escape such an unsatisfactory result. The trouble is that the fresh air inlet stops up silently and without the knowledge of any one, and open or closed it does not seem to interfere with the pursuit of happiness in any particular, few householders understanding its importance.

Under the present health rules of New York city it is inserted in the house drain, on the inner side of the main house trap, as shown in Fig. 1.

In addition to the objections above noted, *i. e.*, stoppage at A by accumulation in grating or brick box, there is a very important objection to this plan. When the grating is clear and the pipe open to air current as primarily intended, it will be seen at a glance that the discharge of a large body of water or other matter into the soil pipe at any point beyond the house trap will cause the current of air to change for the time and flow toward the street through the fresh air inlet pipe, which must emit in the case of the discharge of a water closet an objectionable and offensive odor, to say nothing of the danger to the neighborhood or pedestrian from infectious disease should the inhabitants of the house be stricken with contagious sickness.

Children while at their plays in tenement house districts frequently sit on the curb, sometimes for hours. Passing through the avenues on the easterly side of our city, one can count hundreds of them sitting flat on the sidewalks totally unconscious that they may be inhaling the germs of some disease which a tenant of the house may be stricken with, and which is emitted in puffs from the fresh air inlet grating. This is not romance, but actual fact.

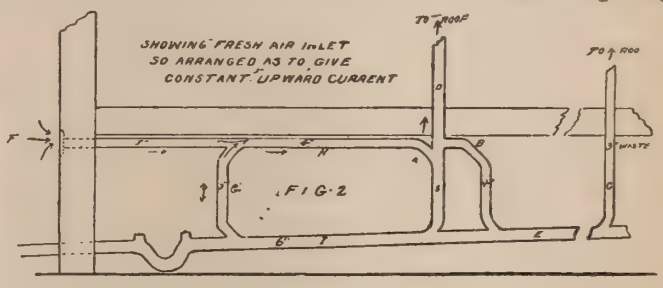
Considering, then, that in most instances the fresh air inlet is rendered impracticable by stoppage when placed on a level with the sidewalk near the curb, which almost any city plumber will verify, and that in a few instances where it remains open there is danger in the dissemination of infectious disease, should not same radical change be adopted?

The "fresh air inlet" is made necessary theoretically by the employment of the "running trap," or trap on main drain near front wall. (Fig. 1.)

This trap is placed here to cut off the possible egress of gases to house limits, which may arise from the street sewer, and there is undoubtedly wisdom in placing this trap here under *some* conditions, but it is not necessary to place the fresh air inlet where it will be offensive or liable to stoppage.

In buildings which are not used for dwelling purposes, such as warehouses, office and public buildings, the fresh air inlet may be placed at the side of stoop, terminate in a stepping block on the curb with grating on the street side, or connect with a ventilating hitching-post which will be so constructed as to serve in the dual capacity, but in no case should the air inlet be less than 10 or 12 inches above the grade, so that it may not be covered by snow or refuse or stopped by carelessness.

With dwelling houses it may be continued to the rear yard and extend above the fence line as far from rear windows as possible, or an application of Fig. 2 be made, which will, when properly adjusted, always find draught in upward direction if used in connection with a certain character of ventilator, applied at the roof outlets, which are so constructed that they cause an upward current no matter in what direction the wind may be blowing, and yet admit air freely when called upon to supply displacement. The fresh air inlet in this instance can be carried out the front of house at any desired point above the grade, or left flush with front wall and terminate with ornamental grating.



A quantity of water suddenly falling through pipe D of sufficient volume to approximately fill the pipe, such as the discharge of a modern closet in many instances would do, presses before it the body of air which the pipe contains. This action causes atmospheric compression, which also generates back

pressure, and in Fig. 1 this contaminated air is vomited through the fresh air inlet to the curb.

In Fig. 2 this air is liberated through pipe B, and thence through E to such pipes as C, escaping ultimately at roof. Passing the point A (Fig 2) the discharge through vertical pipe tends in such passage to draw in air through F and H, thus increasing the rapidity of circulation through those pipes.

A consideration of this plan will convince the reader of its ability to maintain a permanent upward current through H and D, except at such times when the wind may blow down the soil pipe from roof or blow against some adjacent structure, which would cause a deflecting current.

The application of the ventilating caps above referred to will obviate this.

Referring to pipes G, F and H, it will be noticed that their relative sizes are such as to maintain an upward current through I, thus ventilating the horizontal drain equally as well as in Fig. 1.

Starting at F with 5-inch pipe, we reduce at the junction of the trap branch to 4-inch, providing a 3-inch trap branch, thus the surplus air passes downward through G and I.

PLUMBING INSPECTION FOR COLUMBUS, OHIO.

The plumbers of Columbus, Ohio, want an inspector of plumbing and should have one; so should every city in the country where plumbing work is done. Mr. D. N. Kelley, president of the Columbus Master Plumbers' Association, has addressed an open letter to the Board of Public Works of that city, giving the best of reasons why an inspector of plumbing should be appointed, and we doubt not that reasons as good as these can be found in every city where there is no plumbing inspection provided.

In his open letter Mr. Kelley takes up a building that has just been finished and points out the defects in the plumbing work and then very properly asks the question, should not a competent inspector be appointed to prevent such incompetent, recklessness and criminal negligence in plumbing work? Among the defects mentioned in the building named the following are found: The traps under the bath-tub and wash-stand are not ventilated at all, which is necessary to prevent syphonage and consequent escape of sewer gas into the room. The trap under water-closet is ventilated, but this vent pipe is not connected back into the soil pipe by means of a lead ferrule caulked into the hub of the tee, but the pipe is simply stuck in the hub and the joint made with putty, which, when dried, will shrink and allow sewer gas to escape into the room.

The four-inch lead bend under water-closet is not connected to the soil pipe by a lead ferrule caulked in the hub of the tee, and the bend soldered to the ferrule as it should be, but a piece of cast-iron soil pipe is stuck in the end of the bend without soldering, which is then caulked in the hub. Also, there is no stop-cock just under the tank in the attic on the discharge pipe to fixtures, and if any faucet gives out or any pipe bursts, the family can quietly wait till all the water runs out of the tank, either over the floor, ruining carpets, or between floor and ceiling, causing the plastering to fall, before they can have the leak repaired.

The inspector will also find that the lead pipe supplying water to water-closets is what is known as "medium lead pipe" instead of "strong," as required by the rules of the water works department.

The above defects actually exist in that new job of plumbing, and we ask, are they not sufficient and horrible enough to cause everyone of you to shudder with fear and remorse for the heinous sin of failing to do your duty in protecting the lives of the citizens by requiring all plumbing to be done in the best sanitary manner by thoroughly qualified plumbers, under the personal supervision of a plumbing inspector, who should be a first-class plumber, and moreover, as every city in the state outside of Columbus, and in every state in the union, has provision made for building and plumbing inspectors, and laws adopted specifying in detail how plumbing work shall be done and the kind and quality of material that shall be used—is not this fact sufficient to convince you, and especially the member from the East End, that the appointment of a plumbing inspector is not only just and proper, but emphatically demanded by the laws of health?

The letter written by Mr. Kelley is a strong one all through, and the facts he lays before the Board of Public Works are sufficient to convince any reasonable man that plumbing inspection for that city is demanded by the highest consideration of public health. Should the Board longer refuse to grant the request of the master plumbers of Columbus, their refusal must be looked upon with some degree of suspicion. Where any set of men can deny so just a demand, and refuse to grant so great a public good, we must believe that they are actuated by some personal motive which wholly unfits them for competent public servants. They lay themselves open to the charge of incompetency and some influence, political or otherwise, which tends to their personal gain. As the saying is, Mr. Kelley has "put the Board in the hole." He has confronted them with evidence too strong to be disregarded, and has left them with no excuse for not providing plumbing inspection. This cannot apply to one member of the Board who is a plumber and heartily supports the master plumbers in their endeavors to procure inspection. The plumbers should receive the support of every citizen of Columbus, and such a demand should be made by the public that the Board would be compelled to grant it or retire. Men who dally and toy with such a thing as public health are unfit to receive public confidence or favors.

VENTILATION AND HEATING OF HALLS OF AUDIENCE.

Walter B. Snow in *Architecture and Building* writes as follows:

The expression, halls of audience, as here employed, comprises all rooms, halls or building in which the occupants are assembled in a condition of physical inaction, and includes everything, from the schoolroom, with its pupils seated and well separated, to the crowded public hall, with its crush of standing occupants covering every square foot of floor, The former may be well and easily ventilated and heated, the latter only by a system that is specially designed to meet the requirements.

The more crowded the hall the less important becomes the question of heating and the more important that of ventilation. What, then, is ventilation? It is not the only removal of foul air, but the substitution for it of pure, fresh air. The amount of air thus removed and replaced must necessarily be the measure of the quality of the ventilation. With properly warmed air introduced into the room in the most approved manner, *good ventilation* and *comfort* must go hand in hand. Neither experiment nor calculation is needful to prove to the occupant of a poorly ventilated room that such a condition of the air exists; he is uncomfortable and that is enough. But we may, however, by observation learn at what degree of ventilation comfort merges into discomfort. Necessarily, there can be no sharp demarkation but enough can be ascertained to enable the engineer to make the requisite provisions.

A failure to recognize the great difference between the theoretical and the actual requirements has been the cause of the lack of success of many systems. Careful experiment has shown that an average man when awake, but physically inactive, makes sixteen respirations per minute. As thirty cubic inches are inhaled and exhaled at every respiration, it is evident that the actual requirement for air supply is 480 cubic inches per minute. But such actual requirement would only suffice in case the exhaled and useless air were immediately removed and only absolutely pure air supplied for the next inhalation. The realization of such a supposition is practically impossible. The air discharged from the lungs is instantly dissipated in the air surrounding the person, who must, for the next breath, draw in air polluted to this extent. With an air-tight room, the continuation of this act must eventually result in suffocation and death. Hence to secure good ventilation it must be necessary to supply fresh air in such quantity as to sufficiently dilute this vitiated air. The degree of this dilution is commonly measured by the proportion of carbonic acid gas present in the atmosphere. Fresh out door air seldom if ever containg more than 4 parts of carbonic acid in 10,000 of air, or 4-100 parts of one per cent. By the passage of the air through the lungs this proportion of carbonic acid is increased about 100 fold, so that it forms 4 per cent. of the total volume. About one-fifth more is given off by the skin. Assuming that an amount of air is supplied sufficient to dilue this to the same proportion as the breath, then, obviously, about 585 cubic inches

or .33 cubic feet of air are actually required to supply the fixed requirements of the body.

Experience shows that the true line of comfort is passed when the carbonic acid exceeds 6 to 7 parts in 10,000 of air. Therefore, to dilute to this proportion each .33 cubic feet of air containing 400 parts in 10,000 there would be required 19 to 22 cubic feet per minute, or 1,140 to 1,320 cubic feet per hour. Affecting circumstances, such as movement upon the part of the individual, the presence of gas as an illuminant, and certain difficulties in the way of perfect circulation of air throughout the room, have resulted in the general adoption of 30 cubic feet of air per minute per person, as the minimum air supply for halls of audience occupied for several consecutive hours. Dr. Billings even goes so far as to assert that, "I certainly do not believe that 30 cubic feet of air per minute in rooms continuously occupied will secure good ventilation, nor do I think that an architect or engineer is justifiable in preparing plans upon the basis of such an amount of air."

Although the carbonic acid present is a measure of the quality of the ventilation, yet strange to say, it is not the mere presence of carbonic acid that causes the air to be oppressive. That this is true is evinced by the fact that in soda water manufactories, where the air is very heavily charged with carbonic acid, no objectionable or injurious effects are experienced. In fact this gas is not poisonous, it is merely neutral; like nitrogen it is not a supporter of life.

It is in reality only on account of the bad company it keeps that it becomes an index. This bad company consists of numerous other gases present in very small proportion, but co-operating with the polluted moisture in the air to cause a feeling of weariness and headache when the proportion of the carbonic acid exceeds 6 or 7 parts in 10,000.

The following figures cited from the experiments of Dr. Angus Smith, in London, give some idea of the character of the atmosphere in many places of amusement:

	Parts of Carbonic Acid in 10,000 of Air.
Surrey Theater, boxes, 10 P. M.	11.1
" " " 12 "	21.8
City of London Theater, pit, 11.15 P. M.	25.2
Standard Theater, pit, 11 P. M.	32.0

Disagreeable and injurious effects cannot fail to result from continued exposure to such seriously contaminated air. The amount of air furnished in these cases was small, and is easily calculated from a knowledge of the carbonic acid in the air supplied and that removed; for a known amount must have been necessary to dilute, to the resulting proportion, the air direc- from the lungs.

In large rooms occupied for short periods and only at intervals the initial air volume in the room often affects and lessens to a considerable degree, the amount of air to be supplied.

Experiment has taught us that a velocity of air current in excess of 3 feet per second is perceptible. It is therefore necessary in the design of any system, to so arrange and locate inlet and outlet registers that the air shall at no time exceed this velocity as it impinges upon the person. When it is considered that in a closely crowded room it is often necessary to change the air volume once in five or six minutes to secure satisfactory ventilation, it will be evident that considerable care must be exercised to prevent objectionable draughts.

As already intimated, no matter what the quality of the ventilation, the temperature of the room must be right to secure actual comfort. It is a mistaken idea to think that a room is well vent tilated *simply* because it is cool.

Heating, in its commonly accepted sense, is, in reality, the providing of such a warm medium about the body as will prevent the too rapid dispersion of heat from it. Although heat is dispersed from the human body by conduction and by evaporation of moisture, yet the greater part is radiated to the colder surrounding objects. Thus one may enter a room in which the air has a temperature of 75°; with walls of 50°, and feel chilled, simply because of the radiation of heat from the body to the walls. High humidity has much to do with comfort at a given temperature, so much in fact, that a temperature of 55° to 60° in moist England is as pleasant as a temperature of 68° to 70° in New England. These latter figures appear to be very generally accepted as representing the usual practice in this portion of the country.

It is self evident then that success in heating and ventilating can best be obtained by a combination of the two in a single system. They must be dependent, yet independent. It should certainly be possible to ventilate without heating, and it should further be possible to so temper the air required for the varying needs of ventilation as to maintain a constant temperature within the room. Thus, with few occupants there would be required a small volume of high temperature, while with a crowded room the temperature of the large volume would be reduced to a minimum.

A satisfactory combined system of ventilation and heating must embody the elements of efficiency and economy, it must be easily controlled and variable to suit all conditions, positive in its action and unaffected by changes in the weather, the air must be introduced and removed unobjectionably, and perfect command must be possessed over the temperature, volume and quality of the air supplied.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

A writer signing his initials to his communication states that the smoke from burning coal can be greatly lessened, simply by wetting the coal before it is placed in the furnace. There is such an error as this going the rounds, and it is old enough to be exploded, and should have been long since. We have seen this statement made in many journals, and in some that should have known better. There is no doubt something is to be gained in wetting coal. The dust is prevented from rising and settling on everything about, and the little particles are prevented from being drawn up the chimney instantly. It prevents, flashing as the coal comes in contact with the fire and the escape of small particles of carbon, as may be seen by a simple trial. When the coal is wet these small particles are prevented from being drawn up the stack and they are not burned until the heat in the furnace has driven the water off. A writer on this subject claims that the greater part of the water thus supplied is evaporized and escapes in the form of steam, taking with it a great deal of heat which otherwise would go to make steam in the boiler instead of in the smoke-stack. A small portion of the water may be disassociated into its component gases, viz.: oxygen and hydrogen. When this occurs the gases unite and form an intense heat which goes toward making steam in the boiler, but it must be borne in mind that however much the heat was derived from the combustion of these gases, an equal amount of heat was absorbed by the water during the gaseous form. In other words water is a product of combustion. It is the ash that is left after the two gases have been burned, and to burn the water over again, just as much heat must be put into it as can be derived from it during recombustion.

It would seem that there are some persons who give their opinions on this matter that rapid combustion is the cause of smoke, and that a slow-burning fire is the remedy to be supplied in all cases. There is a difference between rapid combustion and perfect combustion. A rapid combustion in the sense in which it is here used may be imperfect and cause smoke. On the other hand slow combustion may be so perfect that no smoke will result. The object is to consume all carbon and thus prevent it from escaping up the stack with the heated air. On this subject some one has started the following which has been going the rounds of the press:

"A curious invention has been made by an engineer in Russia named A. Clausen. It is a smoke burner which is claimed to consume every particle of coal, even the worst of soft coal, and it is based on a principle which is the direct opposite of the one that has been held for years to be the only one by which a complete smoke-consumer could be constructed. It has been held that the cause why so much carbon escaped in the ordinary furnace in the form of smoke, causing at once an enormous waste of material and a pollution of the atmosphere, was that an insufficient supply of air was admitted, so that there was not enough oxygen to burn all the carbon. Smoke burners have been constructed with a view of admitting as much air as possible and passing it through the fuel, where it would come in contact with the coal.

In this way smoke consumers have been constructed that did their work tolerably well.

"Mr. Clausen, however, started to solve the problem by first analyzing the matter that escaped through the smokestack, and claims to have found that a large part of it consisted of free oxygen. He concluded that the fault lay not with a lack of air, but on the contrary, with too large a supply of it. He reduced the amount of air admitted to the furnace until he came to a point where he admitted air only through two little holes of the diameter of an ordinary lead pencil. When he attained this he claims the combustion of the coal was complete. Reports come from Paris and London indicating that experiments on a small scale have been made with the new invention and have proved remarkably successful."

It seems to us that Mr. Clausen has an apparatus that will be very successful in producing carbon. It is probably the next thing to the coal pits where charcoal is made, or a process similar to that which may have been going on when our vast coal beds were made, when oxygen had but little to do. School boys see pieces of steel burn fiercely in a jar of oxygen, and know that when ashes shut up the front of a stove the fire will go out. A small amount of air only is probably necessary where a small fire is needed, but we doubt the capacity of two holes the size of a lead pencil as being sufficient to supply the ordinary furnace. We can burn almost anything in sufficient oxygen, but a blanket thrown over burning oil will extinguish it by shutting out the air.

The smoke preventer will be the device which will supply the requirements of perfect combustion and at a rate to meet the demands of the amount of heat that is necessary for the work to be accomplished. The successful devices now in operation are constructed on this plan and we know of no other theory on which even to speculate. The most important question confronting us now is how to get those devices in use. Cities desiring to be rid of the smoke nuisance need not waste time in pouring water over the coal or in making two holes the size of lead pencils in furnaces. They will succeed better by securing the use of the devices at hand. This cannot be done in a day or by one effort. It will of course take time and a great amount of labor, but it will succeed. There will have to be done a certain amount of educating and a greater amount of compelling. All reforms have come by a pressing necessity for them and a vigorous assault on opposing forces. The same will be the case with the reforms in the prevention of smoke. If a clear atmosphere and a clear city are worth the effort, then make the effort. If not the smoke will continne to depreciate values and reduce healthfulness and vigor.

A FEW HINTS ABOUT DRAINAGE.

In a selection of a site for the country house, writes Mr. F. W. Chandler in the Quarterly of the Massachusetts Institute of Technology, however great the attractions may be, avoid any not well drained naturally. Much can be done by artificial drainage, but any ordinary filling only raises the finished surfaces of a few feet more or less above the wet which is difficult to drain away. This applies particularly to level lands, as on a slope drains may be laid that will lead the water to the surface at a lower grade than the bottom of the house cellar.

On the other hand, the soil may be perfectly dry, but hard and clayey, land that in the spring time makes the plastered walls of the cellar damp, and wet spots to show perhaps, on the cellar concrete; for after heavy rains, because the soil will not leach, the water will follow down along the house and easily find an entrance through the ordinary cellar wall. This is land perfectly healthy to live on, if it can be drained to take care of the few wet months, for during the long summer everything is perfectly dry. If there is a public sewer, both the sewage and this water can be taken care of satisfactorily. If there is no public sewer, then reliance must be placed on the cesspool. In considering either case, the draining of the cellar wall is the first part of the system to be arranged for in the order of building. The bottom of the wall begins commonly from 12 to 18 inches below the finished cellar floor. The trench from the outside of the cellar wall to the bank should be at least 12 inches wide at the bottom and 2 feet at the top; this allows plenty of room to examine the building of the wall, to see that it is carefully pointed to shed water, or to see that the outside of the wall is thoroughly plastered with clear cement—a valuable precaution to take with a wet soil. At the bottom of this trench the drain pipe is laid, and above this the filling may begin with small stones, gravel free from clay, or sand, allowing 18 inches at the top for loam. In the laying of this drain pipe care must be taken to have a regular fall to the outlet. The grade may be as little as one in 400 and be effective.

THE DRAIN PIPE.

The highest point of this drain pipe should be at the bottom of the footing stone of cellar wall, and the lowest point nearest to the sewer or cesspool, as the case may be. The drain pipe used for this work should not be the agricultural tile drain so commonly used, but should be of second quality glazed pipe 4 inches in diameter, as advised by Mr. Ernest W. Bowditch. The second quality is perfectly strong, but the glazing is imperfect, or it may be twisted, or the hub cracked or broken, all faults of no consequence in this work. In regard to expense, this second quality costs less than the ordinary drain tile. The great advantage of this pipe is the security of a large, clean aperture effected by the hub. The tile drains are only 2 or 3 inches in diameter, and are usually laid from ¼ to ½ inch apart; this aperture is covered with tarred paper or cloth to prevent the earth working in, and then the trench is filled up; but with the greatest care taken, these tiles often get entirely choked up, and the porosity of the tile amounts to nothing. Mr. Bowditch has been called upon a number of times as an expert to find a reason why the cellar walls and floors should be wet, when the system of drain tiles had been laid in the most thorough manner, and has invariably found the chocking up of the tiles with earth to be the cause, and has replaced the same with the 4-inch glazed pipe with entire success. This pipe should be laid with the hubs pointing downward, as a better protection against earth entering the joints, which are of course uncemented. When the trench is carefully graded, it is better in laying this pipe to cut out still more of the earth for the hub, to insure an even bed for the pipe; and when the entire circuit of the walls is made, and the two ends joined to make one outlet, this must be entered into a trap, and this connection made as thoroughly as possible with clear cement. Whether this drainage pipe enters into the trap, or is led out to the surface at a lower level, it is important that a copper wire netting should be so placed as to prevent rats or other vermin entering, as they might if the pipes became dry. This netting should be put into the end of the second length, so that the last length can be crowded against it, and so insure its remaining. The trap must hold a large amount of water to guard against too rapid evaporation; it should be at least 2½ feet in diameter, with 14 to 16 inches depth of water. It may be built of brick laid in cement, or it may be of one of the patterns now found in the market. The outlet from this to the drain must begin with a bend which should lead down to almost touch the bottom, and where passing through the wall of trap must be cemented in the most thorough manner, and the rest of this outlet pipe must be laid carefully in cement, the hubs pointing upward to its connection with the sewer—this outlet pipe being of the best glazed pipe.

SUBSOIL DRAINAGE.

It must be borne in mind that during the summer months the soil will probably be entirely dry, the water in the trap will naturally evaporate, the seal be thus lost, and sewer gas then have free entrance through trap and inlet, and so about walls of house. To avoid this danger it is best to lead one of the rain water conductors from roof into this trap, and as a further precaution, as in case of a draught, build a chimney from trap to top of ground with an iron cover, so that it can be filled by a hose or other artificial way. In this case the rain water conductors should each have an S trap, or a larger one if possible, at its foot, to lead into a system of their own similar to that draining the walls, the final outlet to enter wall waste-pipe beyond the trap. It must be understood that the work thus described is from necessity, not choice, as in every case where it is possible to do so this subsoil drainage should be led to lighter soil, where it can leach away and be a system of its own, not even connecting with a sub-soil sewage system, in which case there need be no trap, but do not omit the copper wire netting before spoken of. It may be found as the work progresses that at times water comes up through the cellar floor, and this must also be taken care of. Such a floor

must be covered with at least 6 inches of broken stone throughout, besides the finish of concrete; but in addition a graded trench should be dug, say 6 inches deeper at the lower part and 12 inches wide. The trench should be the whole length of the inside walls running parallel with them, and, say, 12 inches away. At the lowest part of this trench put in a trap, and from this trap lead a 4-inch iron pipe with bend, turned down to almost touch bottom, and lead the other end through the outside wall into trap above water line, if waste must finally enter sewer, or into the sub-soil drain of a water conductor if the overflow is allowed to leach into the soil. This cellar trap is made by the Akron and Portland Companies, and seems to be all that is wanted. It is of glazed earthenware, with an iron cover, about 16 inches in diameter and 2 feet long. It is a regular cylinder, and the upper half is perforated with small holes, and when the trap is sunk so that the cover is flush with finished floor these perforations are opposite the broken stone stratum through which filters the water. It very rarely happens when the walls are properly drained that there is any appearance of wet on the cellar floor, but this is a very valuable expedient for an old building where the foundation walls are so poorly built that the earth cannot be removed from the outside of them to put the drain there, without endangering its stability, or for any cause where it is not desirable or feasible to put in the outside drain. The inside drain will do the work perfectly well, but, of course, it would be better if this dampness were outside the cellar wall.

One could hardly wish to build where all these precautions are necessary, and it might be said that such conditions are rare; but there might happen even a more complicated case where there is no sewer, and tight cesspools must be used either because the earth will not leach or there is not area enough to allow of sufficient sub-soil drainage. In this last case there must be a cesspool for the sewage and another for the cellar drainage. Pumps should be fixed over them, and they must be emptied regularly.

THE CESSPOOL.

Thus far there has only been considered the drainage necessary for a dry cellar, and the mode of entering the soil-pipe into the sewer is too well known to need further explanation; but in the case where the sewage can be disposed of by sub-soil drainage the method as carried out by Mr. Bowditch seems by far the best, and this method was also devised to take the place of intermittent flushing tank with its system of main and lateral tile drains, which may under favorable circumstances work well enough but cannot be relied upon. The same difficulty obtains in this case as about the cellar walls; the small pipes are too easily choked. More or less of the system thus becomes inoperative, the drainage becomes too concentrated, and the first sign of failure is the appearance of wet on the surface of ground —it "fountains up." Then again, the complication of flush tank should be avoided in every case, until a better reason for using them is found than now exists; they are liable to, and do get out of order. The system, as carried out by Mr. Bowditch, is to have a tight cesspool at least 50 feet from the house, into which is led the soil pipe and overflow from grease trap. The cesspool should be 3 feet in diameter and 5 feet high, and the inlet should enter at the top, and the outlet to run out, say 3 feet from the bottom, so that all solid matter shall remain in the cesspool, which must be cleansed out occasionally. Of course the connection of house with cesspool must be of the best pipe and of tight joints, but the outlet is to be built of the second quality of glazed pipe, as before spoken of, to be 5 inches in diameter, laid with the hub pointing downward. If the soil will allow it, Mr. Bowditch digs trenches for the main and lateral drains from 3 to 4 feet deep, say, 10 inches wide at the bottom and 18 inches at top. This trench is then filled in with broken or small stones, so that when the pipe is laid on them there shall be 18 inches of loam over the top of pipe. The latteral drains are put in 20 to 25 feet apart, and their length is limited by the size of the land; for example, a lateral of 100 feet might be enough; but if it were found insufficient the main should be continued 20 feet and another lateral built on and gates are put in so that the sewage may be directed into any lateral desired, to give others a rest. If the topography of the land is favorable, it is a good plan to lead a waste pipe from bottom of cesspool out to the lower slope, where a compost heap is collected, and allow the entire cesspool to run out at regular intervals. The pipe in the trenches should be placed as near the surface of ground as possible, but not so near as to endanger its working in winter. Eighteen inches of soil is not too deep for the air to penetrate, and its oxygen is doubtless more effective in the purification of sewage than the action of plant life. During the winter, the one is of course inoperative, and the other must be very much hindered by the frozen ground, so that during this time sewage must be got rid of principally by leaching.

CONVENIENT TO HAVE ABOUT.

Alcohol and whiting is recommended for cleaning windows long begrimed with dust and smoke.

Test bricks by striking them together. If they ring they are good; if they are dumb they are not.—*The Engineer, N. Y. City.*

Leaks in cisterns can be repaired by applying to the seams a mixture of four parts of linseed oil, boiled with litharge, and eight parts of melted glue, mixed well together. In about two days after application it will be found to have set so hard that water can again be admitted with safety.

To remove ink from paper, if not of too long standing, wet a teaspoonful of chloride of lime with just sufficient water to cover it. Pat, not rub, the spot gently for a few moments, using a soft cloth with the mixture, and then the ink will slowly disappear. If one application is not sufficient, try a second.—*Invention, London.*

A method recommended by *Painting and Decorating* for removing the white efflorescence which often appears on the face of brick work is to wash the surface with a sponge dipped in a weak solution of muriatic acid.

The results of a large number of tests at Newcastle-upon-Tyne, showed that when dense smoke was produced, the evaporative efficiency was but 9.19 pounds per pound of coal, as against 11.05 pounds when smoke was entire prevented; by a difference of 17 per cent. in favor of smokelessness.—*Power.*

To test the enamel or tinning of cooking vessels, etc., for lead, M. Ferdoz suggests a drop of nitric acid, strong, placed upon the enamel or tinning and evaporated to dryness by gentle heat. The spot where the acid acts is then wetted by a drop of potassium iodide solution—five parts iodide to 100 parts of water—when the presence of lead is at once shown by the formation of lead iodide.

It is difficult, says a Belgian journal, to distinguish between iron and steel tools. They have the same polish and workmanship; use will commonly show the difference. To make the distinction quickly, place the tool upon a stone and drop upon it some diluted nitric acid (four parts of water to one of acid). If the tool remains clean, it is of iron; if of steel, it will show a black spot where touched with the acid. These spots can be easily rubbed off.

To clean rust from polished steel, mix 10 parts of tin putty of prepared buck's horn, and 25 of spirits of wine to a paste. Cleanse the article by rubbing with this, and finally rub off with blotting paper.

A gold lacquer, remarkable both for hardness and for brilliancy of color: A clear solution of shellac prepared with picric and half per cent of crystalized boric acid, each separately dissolved in alcohol.

Brass Color—3 ounces seed lac, 2 drachms dragon's blood, 1 ounce turnieric powder, 1 quart 95 per cent alcohol, or methylic alcohol, put in a bottle well corked, and place in a warm place and shake up occasionally for a week or ten days; then strain through a fine cloth; temper with methylic alcohol so as to spread freely with a brush. Heat the tin in an oven about as hot as boiling water; brush the lacquer on quickly, vary the dragon's blood and turnieric powder to suit your taste as to depth of color.

PLUMBING NOTES.

The Hotel Chittenden of Columbus, Ohio, presents an illustration of modern sanitary plumbing, and shows the improvements lately made in this work both from a scientific and artistic point of view. The work that is shown there was executed by the Sanitary Plumbing company of that city, who make a specialty of the highest class of work and the introduction and use of the very latest and most modern ideas. Their contract was an extensive one and covered all of the plumbing in the house, including twenty porcelain-enameled baths in different parts of the building,

forty-two Columbus wash-out closets of the Ohio pattern, twenty-seven stationary wash stands and eight automatic flushing urinals. Probably the most interesting feature of the entire equipment of the house is the splendid gentlemen's toilet room on the first floor. The interior is strikingly beautiful and magnificent, and is pronounced by experts to be the finest piece of work in the State of Ohio. The wainscoting, partitions and wash stands here, as well as in other parts of the house, are of massive Tennessee marble richly ornamented with triple nickeled railings, foot rests, brackets and other trimmings. The well known open style of work has been strictly adhered to in the setting of all the fixtures, insuring cleanliness, and conforming to the latest modes of sanitary plumbing. One of the principal points of the work is the perfect double system of return ventilation, which not only serves to purify the atmosphere of the room, but prevents the possibility of any escape of the deadly sewer gases. Another feature that has been commented upon is the hot water circulating system, which supplies hot water instantly to all parts of the house. Mr. E. A. Futerer, one of the members of the firm, who is recognized as the most expert in his line in the city, gave his entire time and supervision to every part of this work and has secured results that are gratifying not only to the proprietors of the Chittenden, but to the guests of the house. The hotel is at present open for the inspection of visitors and the public will find much to benefit and interest them in examining this masterpiece of the plumbing art.

The poperty in New York of Emily Choteau Sanford, wife of Count Sala, who resides in Paris, has been attached by an order of Judge Barrett in a suit of the Nason Manufacturing Company, against her to recover $324.25 for plumbing work in her house in this city. It is generally supposed that counts and countesses pay no bills, but when they run against a plumber it is different.

The Gas and Steam Fitters' Union, of Columbus, O., last week received an application and initiated one candidate. There are now but two gas fitters in the city outside the union.

The Plumbers Union and Gas and Steam Fitters' Union of Columbus O., held a joint meeting last week to discuss some differences between the work of the plumbers and fitters.

Allegheny plumbers are much dissatisfied over the practice of the city authorities in allowing sewer connections to be made, says the *Journal of Building*. When a contractor has charge of a street sewer which he is constructing for the city, he has the privilege of making a connection for any individual house along the street. No one but the contractor can do the work until the sewer has been completed, and the street put back in the condition it was before it was opened up. It is claimed that if a man living on a street wanted to have a connection made to his house before the sewer is finished, he is compelled to employ the contractor having the street work in charge to do the work and pay him his own price. The latter know this, and take advantage of it, and charge their own prices. The plumbers are barred out, and not allowed to take the contract for the work until after the street is paved. Then they have to pay one dollar to the city to close the street, and go to work and tear it up again to make the connection.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Albany ave. near Twelfth street, Harvey & Mose, 665 North ave.

Albany ave. near Fillmore street, W. H. Cummins, 1236 W. Van Buren street.

5751 Aberdeen street, J. H. Killian, 333 22d street.

5118 Atlantic ave., J. W. Plumstead, 5110 Atlantic ave.

6338 Aberdeen street, M. Weber, 244 N. Clark street.

4947-49 Butterfield street, Sheville & Co., 5032 State street.

Butterfield street bet. 48th and 49th streets, Sheville & Co., 5032 State street.

3030 Butler street, Chas. Juergens, 1274 W. Madison street.

Burling street, near Garfield Park, Jas. Patterson, 411 W. Harrison street.

6752 Bishop street, J. Bain, 6338 Justine ave.

65 and 97 Bingham street, H. Breyer, Jr., 1706 Milwaukee ave.

Bingham street, J. M. Mueller, 3441 S. Halsted street.

Buffalo street south of 88th street, Brunt Bros., 9115 Erie ave.

6208 Carpenter street, J. Monahan, 1636 47th street.

266 Cortland street, H. Breyer, Jr., 1706 Milwaukee ave.

Desplaines street bet. 88th and 89th streets, Sheville & Co., 5032 State street.

Drexel ave. bet. 64th and 65th streets, D. Walsh, 6758 South Chicago ave.

Drexel ave. and 72d street, D. Walsh, 6758 So. Chicago ave.

815 Dania street, Harvey & Mose, 665 North ave.

3715 Dearborn street, P. Schmidt, 4928 State street.

Drexel ave. bet. 75th and 76th streets, Cook & Mangan, 1802 Wabash ave.

5010 Drayer street, C. Kostlevy, 218 W. Eighteenth street.

1514-1516 Deming street, Gruschon & Co., 84 Oak street.

Division street and Elston road, S. Tierney, 537 W. Lake street.

2248 Dearborn street, P. R. Hardin, 3521 State street.

Emerald ave. near 56th street, Sheville & Co., 5032 State street.

7711 Emerald ave., Lyon & Lee, 6215 Wentworth ave.

1314 Eighteenth street, C. Kostlevy, 218 W. Eighteenth street.

808 Eighteenth street, C. Kostlevy, 218 W. Eighteenth street.

1639 Elston ave., Garner & Bahn, 1740 Milwaukee ave.

10418 Erving ave., Webster, Crombie & Henderson, 9243 Commercial ave.

Fletcher street near Southport ave., McCabe, 1715 N. Ashland ave.

3518 Fifth ave., B. A. Finn, 136 35th street.

230 Fremont ave., F. Neustadt, 300 E. North ave.

Fremont near Webster aves., G. Fehr, 80 Canalport ave.

Fiftieth Court near Western ave., A. Miller, 4300 Wentworth ave.

684 Fairfield ave., C. Uher, 524 W. Eighteenth street.

144 Fowler street, D. Whiteford, 372 W. Randolph street.

40 Fisk street, F. Meek, 485 W. Eighteenth street.

Fullerton ave. near Catalpa street, H. Breyer, Jr., 1706 Milwaukee ave.

44th street and Oakenwald ave., M. G. Brooks, 1111 W. Harrison street.

Fulton street, Homan and Kedzie aves., Coolidge & Co., 223 E. Lake street.

7111 Greenwood ave., F. Murphy, 6810 S. Halsted street.

213 Halsted street, Watson & Davidson, 301 Wabash ave.

609 Holt ave., Atkinson Bros., 295 W. North ave.

260 Hudson ave., J. W. Brown, 364 Lincoln ave.

6432 Harvard street, P. K. Hardin, 3521 State street.

279 Huron street, Gruschon & Co., 84 Oak street.

Hoffman ave. near Franklin street, Garner & Bahn, 1740 Milwaukee ave.

276 Harvey street, H. Breyer, Jr., 1706 Milwaukee ave.

50 Hoffman ave., H. Breyer, Jr., 1706 Milwaukee ave.

853 Hancock street, H. Breyer, Jr., 1706 Milwaukee ave.

617 Holt ave., H. Breyer, Jr., 1706 Milwaukee ave.

Ashland ave. bet. 112th and 113th streets, J. Conraths, 5902 State street.

552 Jane street, S. Good, 2409 Cottage Grove ave.

9709 J ave., Brunt Bros., 9115 Erie ave.

Jarnot west of Lyman street, Geo. Franklin, Ravenswood.

Kimbark ave. south of 52d street, Wm. Bowden, 238 25th street.

469 LaSalle ave., H. S. Thompson, 201 E. Randolph street.

6332 Laflin street, J. Bain, 6338 Justine ave.

2706 Lowe ave., M. Weber, 477 26th street.

220 Laflin street, C. Herbert, 120 E. Randolph street.

148 Linden ave., G. Hauslein, Jr., 80 E. Fullerton ave.

Lill street cor. Lincoln ave., Kuhn Bros., 4111 State street.

170 Linden ave., G. Hauslein, 80 E. Fullerton ave.

407 Lincoln ave., Nelson & Cederholm, 87 W. Ohio street.

5656 Lake ave., J. J. Rourke, 5434 Lake ave.

Leavitt street, J. J. Hamblin & Co., 348 S. Robey street.

5623-25 Michigan ave. Nash & Hana, 2216 Wabash ave.

61 Moffat street, Harvey & Mose, 665 North ave.

Monroe ave. and 54th street, F. H. Babcock, 4821 Ferdinand ave.

6517 McChesney street, F. H. Babcock 4821 Ferdinand ave.

4250 Michigan ave., A. W. Bensinger, 173 31st street.
227 Mohawk street, H. Bauer, 232 E. North ave.
3614 Marshfield ave., C. Kostlevy, 218 W. Eighteenth street.
636 Milwaukee ave., R. McCulloch, 231 W. Madison street.
1791 Milwaukee ave., H. Breyer, Jr., 1706 Milwaukee ave.
Morgan south of 57th street, B. A. Finn, 136 35th street.
16 McAllister Place, Wm. Bowden, 238 25th street.
Matteson street near Wood, F. J. Fischer, 7446 Cottage Grove ave.
Madison and Francisco streets, A. W. Murray, 611 W. Madison street.
Madison ave. south of 73d street, J. J. Rourke, 5434 Lake ave.
923 Melrose, M. B. Powers, 3721 Wentworth ave.
1295 Madison street P. J. Morrissy, 417 S. May street.
770 Ninteenth street, J. Hois, 609 W. 21st street.
191 92d street, Tully Bros., Houston ave. and 92d street.
67 Nineteenth street, C. Walter, 403 Blue Island ave.
Noble & Ingram streets, G. Hauslein, 80 E. Fullerton ave.
939 Noble street, G. Hauslein, 80 E. Fullerton ave.
742 Oakley ave., Harvey & Mose, 665 North ave.
1657 Oakley ave., P. McCabe, 1715 N. Ashland ave.
106 Oak street, Gruschon & Co., 84 Oak street.
67-69 Olive street, C. Walter, 403 Blue Island ave.
386 Ogden ave., J. J. Hamblin & Co., 348 S. Robey street.
1810 Prairie ave. E. Baggot, 169 Adams street.
371 Paulina street, C. Walter, 403 Blue Island ave.
Paulina street and Belle Plaine ave., Val Ruh, 548 Wells street.
Powell ave. and Pleasant street, H. Breyer, Jr., 1706 Milwaukee ave.
502 Park ave., Oliphant & Liddell, 268 W. Madison street.
Roscoe east of Clark street, F. Ruh, 1204 Diversey ave.
Racine near Webster ave., P. Jaeschke, 759 Clybourn ave.
Rhodes ave. south of 72d street, F. Fisher, 7446 Cottage Grove ave.
Roscoe street back of church, M. Halfen, 876 Sheffield ave.
63d and Bishop streets, J. B. Sheville, 5032 State street.
5851 School street, J. Conraths, 5902 State street.
4800 School street, P. Schmidt, 4928 State street.
63d and Bishop streets, J. Bain, 6338 Justine ave.
68th street and Stony Island ave., W. R. Thompson, 85 E. Lake street.
1053 Sawyer ave., C. Kostlevy, 218 W. Eighteenth street.
4433 School street, A. Miller, 4300 Wentworth ave.
Sibley street, Wm. Bowden, 238 25th street.
615 Seymour ave., T. Foley, 646 Noble street.
74th street east of Bissell, F. Fisher, 7446 Cottage Grove ave.
6732-34 Sangamon street, J. Bain, 6338 Justine ave.
5240 School street, Wixted & Gibson, 110 39th street.
24 Sholto street, Colter & Son, 867 31st street.
School and Sixtieth, E. Hennessy, 3247 State street.
471 Thirteenth street, W. H. Cummins, 1236 W. Van Buren street.
1493 Taylor street, W. H. Cummins, 1236 W. Van Buren street.
140 25th Place, J. H. Kilian, 333 22d street.
Tripp street near Cortland, T. Low, 112 W. 48th street.
Taylor street near Sacramento, S. Smith, 469 California ave.
Twelfth street and Campbell ave., G. J. Mettz, 2208 Archer ave.
Twentieth and Morgan streets, C. Kostlevy, 218 W. Eighteenth street.
360-62 Taylor street, Wm. Simm's & Sons, 588 W. Madison street.
581 32d street, C. Uher, 524 W. Eighteenth street.
867 Twentieth street, J. Hoiss, 609 W. 21st street.
475 26th street, M. Weber, 477 26th street.
35th street, opposite Park, P. K. Hardin, 3521 State street.
152 Thirteenth street, H. S. Thompson, 201 E. Randolph street.
340 24th street, Wixted & Gibson, 110 39th street.
Vernon ave., Oxford Court, P. Schmidt, 4928 State street.
1274 Van Buren street, W. H. Cummings, 1236 W. Van Buren street.
Van Buren street and Center ave., E. L. Fransted, 443 W. Randolph street.
Van Buren and Wood streets, J. Hoiss, 609 W. 21st street.
6217 Wentworth ave., J. C. Murphy, 21 Blue Island ave.
84 Western ave., Harvey & Mose, 665 North ave.
6322 Wright street, J. Conraths, 5902 State street.
5124 Wentworth ave., P. Schmidt, 4928 State street.
1225 Wilcox ave., W. H. Cummings, 1236 W. Van Buren street.
7334 Woodlawn ave., F. H. Babcock, 4821 Ferdinand ave.
597 Walnut street, C. S. Lawrence, 1315 W. Madison street.
2401 Wabash ave., J. Emblem, 256 31st street.
1024 Whipple street, C. Kostlevy, 218 W. Eighteenth street.
Wallace and Portland ave., Garner & Bahn, 1740 Milwaukee ave.
361 Washtenaw ave., C. Uher, 524 W. Eighteenth street.
Wilson and Wright streets, G. Franklin, Ravenswood.
374 Wood street, T. Foley, 646 Noble street.
112 Winchester ave., F. J. Gillmore, 753 W. Madison street.
1016 Warren ave., Oliphant & Liddell, 268 W. Madison street.

Saxony imposes a tax on cats. This is something new in the fee line.—*Lowell Courier.*

A married couple, surprised in a fight, declared it was only the "lashing of the tied."—*Columbus Post.*

A man is never so sure that his rights are being infringed upon as when his wife gets sick.—*Atchison Globe.*

The married man is making fairly good progress when he is able to hold his own.—*Union County Standard.*

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago. Ill.: Treat and Foltz have planned a 4-story and basement apartment house, 112x54, to be built at the northeast corner of Walton place and Rush street, by John T. Garibaldi. It will be constructed of stone and brick, and will cost $45,000. For Mrs. Harris they have designed an addition to the City hotel, at the southeast corner of state and 16th streets. It will be 63x123 and at present will only be built to a height of two stories. The same architects have planned and construction is under headway on the Lincoln Park Sanitarium for W. C. Goudy, at the corner of Dening court and Lake View avenue. It will be five stories and basement, 54x48. They have also planned a $15,000 addition to Kemper hall at Kenosha, Wis. Thomas & Rapp have planned for George Enger two 3-story and basement factories, each 85x100, to be built on 26th street, one at Shields avenue and the other at Stewart avenue. They will have modern factory equipment, elevators, steam heat, etc.; cost, $80,000. J. F. & J. P. Doerr are planning a 2-story and basement school building, 58x86, to be erected at Naperville, Ill., by St. Peter and Paul congregation; cost, $14,000. For the Rev. Father Genuit they are preparing plans for a 2-story and basement church and school building, 52x96, to be built at the southeast corner of Hoyne avenue and 36th street; cost, $15,000. For Christian Remensperger they have planned a 3-story and basement store and flal building at 2971 Wentworth avenue; cost, $10,000. John Becker will build a 4-story and basement flat building, 25x60, to be built at 3625 Wentworth avenue, after plans by same architect; cost, $8,000. J. E. O. Pridmore has planned for A. P. Spencer a 4-story and basement apartment house, 104x75, to be built at Oakenwald avenue and 43d street; cost, $50,000. John J. Kouhn has designed a 4-story store and flat building, 160x120, to be built at the southwest corner of State and 59th streets, by J. F. Winters. It will be divided into seven stories and thirty-two apartments; cost, $100,000. Treat and Foltz have planned for Hiram H. Scoville a 4-story brick addition to his large factory at 250-254 Clinton street to cost $58,000. J. C. Brompton has designed two 3-story and basement apartment houses, 42x62 each, to be built at the corner of Leland and Commercial avenues, Ravenswood. He has also let contracts for the construction of a 2-story frame residence for J. M. Deering, to be built at La Grange. F. B. Abbott has designed a 3-story residence for J. Johnson, to be built at 1128 West Adams street; cost, $10,000. He has also designed a 4-story apartment house, 45x125, to be built at 36th street and Ellis avenue, by a stock company; cost, $60,000. Dr. L. C. Clark will build a 6-story addition, 48x170, to the west side of his Cambridge apartment house, at the corner of Ellis avenue and 39th street. It will be heated by steam; cost, $125,000. L. J. Shaub has designed a 3-story and basement store and flat building, 24x75, to be built at Robey and Greenwich streets;

cost, $8,000. He has also planned a 4-story and basement store and flat building, 45x75, to be built on Centre avenue; cost, $18,000. E. T. Bergman has designed a 3-story store and flat building, 25x75, for Charles Corezza, to be built at 1436-1438 Harrison street; cost, $12,000. Wilson & Marble have designed a 4-story store and flat building, 100x53, for George C. Watts, to be built on Jackson avenue, near 53d street. It will be warmed by furnaces; cost, $25,000. For Barry Bros. they have designed six 3-story and basement dwellings, 120x75, to be built on Grand boulevard, near 43d street. They will be warmed by furnaces; cost, $54,000. For Mrs. A. J. Fisher they have designed a 2-story and a basement dwelling, 25x64, to be built on Walnut street, near Albany avenue; cost, $7,000. They have also prepared plans for rebuilding the car barns of the West Chicago Street Railway Company, at Western avenue and Washington boulevard, into a horse market for P. C. Kellogg & Co., of 107 John street, New York city; cost, $15,000.——New York City, N. Y.: Boring, Mellen & Tilton have designed for the Equitable Life Insurance Co. four 3-story English basement houses, 18x55 each, to be built at a cost of about $30,000, on the west side of Boston avenue, between 165th and 166th streets. Charles H. Israels has designed two 5-story flats, 25x77, to be built at 313-15 West 17th street, for John McSweeny, at a cost of $34,000. Charles Rentz has designed a 5-story and basement flat, 31x96, for M. Solomon, to be erected at 266 Henry street. The building will cost $26,000. Herman Horenberger has designed two 5-story flats, to be built on 102d street, 100 feet east of the boulevard, by L. M. Muller; a 5-story basement apartment house, which G. J. McLoughlin will erect at 104-6 Bedford street, and alterations which Mrs. E. B. Grannis will make to the house 33 East 22d street. Lorenz F. J. Weiher, Jr., has plans for a 7-story apartment house, to be built on the north side of 72d street, 30 feet west of Lexington avenue. The building will be 125x90; cost, $375,000; owner, Lorenz Weiher, Sr. J. C. Burne has designed a 5-story flat, 25x75, to be built on the north side of 112th street, 150 feet east of Fifth avenue, at a cost of $20,000, for John Shields.——Philadelphia, Pa.: The large lot on the southeast corner of Broad street and Montgomery avenue will be occupied by a magnificent edifice to be erected by the congregation of the Universalist Church of the Messiah. It is said the work will soon be started upon the foundation walls for the nine new 11-story buildings to be built by Claus Spreckels at Front and Reed streets. At 115 North 7th street a 5-story store and warehouse will be erected by Thomas M. Seeds. The structure will have a frontage of 18 feet, and will extend in depth a distance of 147 feet. Negotiations have been consummated whereby the Philadelphia Granite and Blue Stone Company secures a lot 267x244, fronting on 24th, 25th, Locust and Spruce streets, upon which they will at once commence the erection of a mammoth plant. An art gallery will be erected at 3818 Lancaster avenue for Clayton W. Pierson, the art collector, by Contractor Thos. C. Sloan.——Boston, Mass.: The German Lutheran church will erect a $27,000 edifice at 616 Parker street. The Mt. Vernon Church Society will erect a church building at the corner of Beacon street and West Chester Park, to cost $75,000. Walker & Kimball are the architects.——Baltimore, Md.: Chas. L. Carson has completed plans for the reconstruction of the Masonic Temple on North Charles street. It will be finished in about a year, and will cost over $150,000. The Grand Lodge room will be 51x75, and 23 feet high. St. Bernard's R. C. church congregation will erect a brick church and a 3-story brick dwelling at the corner of Gorsuch avenue and Independence street.——Cincinnati, Ohio: Samuel Hannaford & Sons are preparing plans for the Fifth Presbyterian church, to be located at John and Clark streets; cost, $15,000. The materials will be brick and stone. Also for remodeling and adding addition to a large dwelling at Frankfort, Ky., for Mr. Hendricks; cost, $15,000. They will also take bids in a few days tor a stone dwelling for J. H. Rhodes, to be erected at Park avenue and Windsor streets, Walnut Hills; cost, about $25,000. H. E. Siter will prepare the plans for Burkhardt's building, to be located at 4th and Elm streets, on the site of the one recently destroyed by fire.——San Francisco, Cal.: John M. Curtis has completed plans which have been adopted for building the new Hall of Records and Jail at Ukiah, which will cost $40,000. Each building will be 30x55. Smith & Sanders, architects, have completed plans for a 6-story office building, to be constructed of brick, terra cotta and stone, to be built for James Otis; cost, $70,000. A row of eight buildings, containing eighteen tenements, are being erected on the corner of Waller and Scott streets, for Dr. R. H. McDonald; cost, $50,000.——Pittsburg, Pa.: The congregation of St. Mary's German Catholic church, of Sharpsburg, have decided to erect a handsome parochial school at a cost of $42,000. Architects Hodgdon & Thomas have plans for a residence for Mrs. R. W. Patterson, on Howe street, East End; cost, about $18,000. Architects Longfellow, Allen & Harlow are preparing plans for the new building which Capt. J. J. Vandegrift will erect on the corner of Wood and Water streets. next year, a 6-story building of Pompeian brick. Architects Hodgdon & Thomas have completed the plans for the Henry Auction Company's new building on 9th street below Penn avenue. The Grand street "B'nai Israel" will erect a new synagogue to cost at least $50,000.——Milwaukee, Wis.: The St. Gall's and Holy Name Catholic societies have bought 193 feet on Grand avenue, between 11th and 13th, for the purpose of erecting thereon an immense church, which will cost between $250,000 and $300,000. Including the parsonage, the entire improvements on the property will reach the latter sum.

HEATING AND LIGHTING.

New electric light plants or extensions of those already existing are reported as probable at the following places: Mayville, N. Y.; Cincinnati, O., address the Newport Light Company; Goshen, Va.; Muncie, Ind.; Kenova, W. Va., address L. F. Peck; Kensee, Ky., address the Main Jellico Mt. Coal Company; Milton, Fla., address J. B. Crossland, of Pensacola; Leslie, Mich.; Aurora, Ill.; Luling, Tex.; Tarkio, Mo.; Wanoo, Neb.; Butler, Mo.; Waynesboro, Pa., address the Electric Light Company; Claremount, N. H.; Villisca, Ia.; Red Oak, Ia.; Eagle Grove, Ia.; Wakefield, Mass.; Ellicott City, Md., address W. L. Nott; Wheeling, W. Va., address N. E. Whittaker. ——Plymouth, N. H.: Stock in a local light company has been subscribed, and the work of erecting a plant will be pushed as rapidly as possible.——St. George, N. Y.: The plant of the Staten Island Electric Light Company, which was recently destroyed by fire, will be rebuilt as soon as possible.——Schenectady, N. Y.: Bids for street lighting are wanted by the city.——Missoula, Mont.: The Missoula Electric Light Co. will increase its plant with machinery for 1,300 more lamps.——The following new electric light companies have been recently incorporated: Cambridge Electric Light & Power Co., White Creek, Cambridge and Jackson, N. Y.; capital stock, $7,000; Directors, J. B. Rice, J. L. Agan, A. B. McNish and others. Citizens' Electric Light & Power Co., Springfield, Ill.; capital stock, $100,000; incorporators, L. Sparks, J. W. Jefferson, P. H. Day. Edison Electric Illuminating Co., Atlanta, Ga.; capital stock, $10,000; incorporators, J. F. Dickinson, W. H. Rhett, W. H. Inman. Georgia Electric Light Co., Atlanta, Ga.; capital stock, $600,000; incorporators, H. M. Atkinson, H. E. W. Palmer, W. R. Joynes and others. Penn Yan Electric Light & Power Co., Penn Yan, N. Y.; capital stock, $100,000; incorporators, H. O. Stimson, of Boston, H. Russell, of Albany; H. L. Woodruff, of Penn Yan, and others. Van Gestel Lamp Co., Denver, Col.; capital stock, $200,000; incorporators, J. W. Flinthan, M. H. Stearn, N. M. Tabor and others. Kettle Falls Light & Power Co., Kettle Falls, N. Y.; capital stock, $100,000; incorporators, G. H. Smith, A. A. Davis, J. H. Richards and others, all of Rochester.

SEWERAGE NOTES.

Dover, N. H.: It is proposed to spend $10,000 on sewer extensions.——Palmer, Mass.: Plans for sewerage have been prepared by Mr. Van Valkenburg.——Woonsocket, R. I.: Reports on a sewerage system have been submitted.——Meriden, Conn.: The Sewer Committee has under consideration the plans prepared by T. H. McKenzie, of Southington, for an irrigation sewerage system.——Newton, N. Y.: A drainage system is proposed at a cost of about $26,000.——Holland Patent, N. Y.: A sewer to Beaver Creek is being encouraged by F. N. Phelps, Foresport.——Bridgeton, N. J.: Plans for a sewerage system will be prepared by Prof. C. McMullen, of Princeton.——Ironton, Ohio: Rudolph Hering has presented a report recommending the separate system, with a combined sewer for the Rachel Creek Valley.——Oberlin, Ohio: A sewer system is being designed by Dunham & Paine, of New York.——Charlottesville, Va.: The City Engineer is making a topographical survey for the purpose of laying out a sewerage system.——Mason City, Ia.: The city will advertise for proposals

for a sewer 4,500 feet long, of 8-inch to 14-inch pipe.——New Whatcom, Wash.: The report and plans of Mr. J. N. Muller, of St. Paul, Minn., have been accepted by the City Council. He recommends the separate system, discharging into Bellingham Bay, and estimates the cost at $226,000, or about $10,765 per mile.

WATER WORKS NOTES.

Lancaster, N. H.: It is proposed to put in $50,000 works.——Whitefield, N. H.: Surveys for works are being made by a company.——Preston, Conn.: Works are proposed.——Carthage, N. Y.: There is a strong sentiment in favor of works to be owned by the village though Moffet, Hodgkins & Clarke, of Syracuse, have made a proposition to put in works.——Carbondale, Pa.: The Carbondale Water Co. has been incorporated with a capital of $10,000.——Thompson, Pa.: The Thompson Borough Water Co. has been incorporated with a capital of $5,000, all paid in.——Waynesborough, Va.: The Street Railway, Light & Water Co. and town joinly propose to build works at once. Cost $12,000 to $15,000. There will be about 3 miles of 8 to 4-inch pipes and 15 hydrants.——Salem, N. C.: About 5,000 ft. of 10 and 3,900 ft. of 8-inch mains will probably be laid.——Atlanta, Ga.: The West Side Land Co. has been incorporated by J. R. McKeldin, J. E. Carlton and others; capital, $25,000. It is reported that water works and a sewerage system will be put in.——Perry, Ga.: City works with a supply from artesian wells is talked of.——Plaquemine, La.: J. A. Grace is president of a company organized to build works.——Franklin, Ky.: Address S. N. Farline in regard to proposed works. Estimated cost $25,000. Indianapolis, Ind.: Works are projected by A. H. Nordyke and A. K. Hallowell to supply their property in the northeast part of the city. Cost about $20,000.——Valparaiso, Ind.: A local company has been formed to build a new system; capital, $50,000.——Buchanan, Mich.: Bonds to the amount of $50,000 have been voted for water-power and works. Romeo, Mich.: Bonds to the amount of $26,000 have been voted for works.——Milford, Mich.: Works are again projected.——Berwyn, Ill.: The Water, Fuel & Light Co. has been incorporated by W. J. Andrews and others; capital, $25,000.——Monticello, Ill.: The council has voted to build works——Dallas, Ore.: Works estimated to cost $60,000 will be built by a company to be formed by Chas. P. Shore, Palace Hotel, San Francisco.——Chihuahua, Mex.: The Chihuahua City Water Co. has been organized with a capital of $350,000. There will be a 5,000,000-gallon distributing reservoir and two high duty pumps with a combined capacity of 5,000,000 gallons. There will be 12,000 ft. of 16, 2,000 ft. of 14, 39,000 ft. of 8, 10,000 ft. of 6 and 5,000 ft. of 4-inch mains; also about 75,000 lbs. of specials and 12 hydrants.

BIDS AND CONTRACTS.

Paw Paw, Ill.: Bids for works to cost from $8,000 to $10,000 are wanted until August 21.——Washington, D. C.: Proposals will be received until August 17, by the Commissioner of Indian Affairs, for erection of stone school building on Pipestone Indian Reservation, Southwestern Minnesota. Address T. J. Morgan, Commissioner.——Washington, D. C.: Proposals will be received at the Bureau of Navigation, Navy Department, until August 21, for the construction of a building for the use of the Naval Torpedo Station at Coaster's Island, Newport Harbor.——Dartsmouth, N. S.: Proposals are wanted until September 1, for the construction of a system of water works. Address Mayor Frederick Scarfe, as above.——Terre Haute, Ind.: Sealed proposals will be received by the City Council until September 1, for the construction of 4,630 feet of brick sewer.——Savannah, Ga.: Bids are invited until August 26, for cast iron water pipe and specials. Address James Manning, superintendent of water works, or Thomas T. Johnston, Consulting Engineer, 171 LaSalle street, Chicago.——Gainesville, Fla.: Proposals are wanted until September 1, for the construction of a system of water works.

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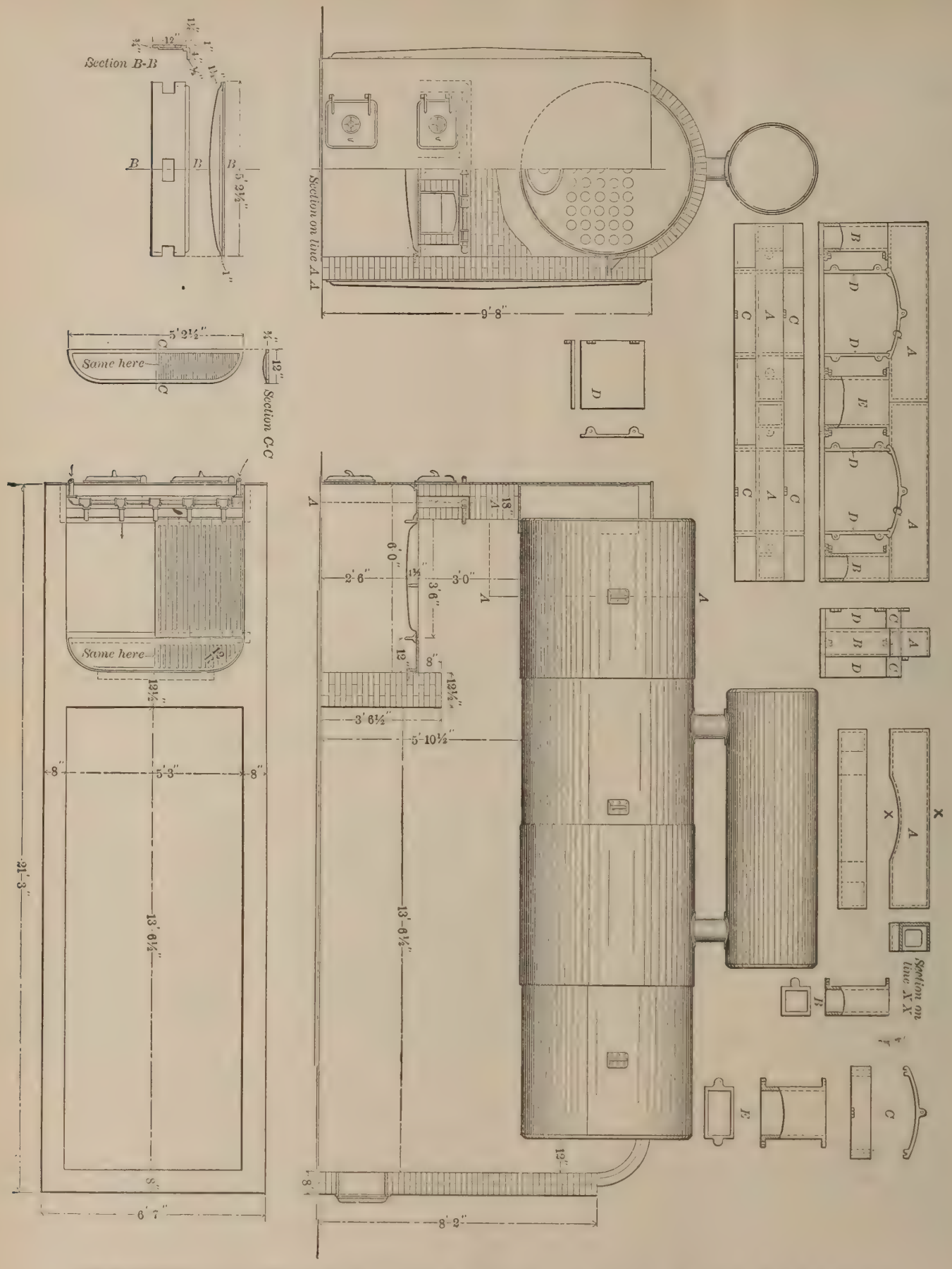

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W. S. HUTCHINSON, 6 Washington St., Chicago.

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Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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COMPLAINTS reach us regarding inferior plumbing material plsced upon the market by some firms. We fear that the plumbers themselves are responsible for this to a great extent. Cutting prices, unfair competition and the like have made a demand for cheap material to supply a want created by low bids and cheap work. Keep up the prices so that good material may be used and the demand for cheap material will soon cease and with it will stop the supply of. it. Cheap material will not be manufactured unless there is demand for it, and there could be no demand for it at fair prices for work.

IT is a curious thing that people do not like to believe in anything designed to prevent sickness. They love to consider all such things as the notions of cranks, and pay no attention to them. In an Eastern city recently an examination of the well water was made and found to be polluted. The family on whose premises the well was located was so informed and the well ordered closed. No attention was paid to the matter, and the result was four of the family had typhoid fever and two died. Typhoid fever had been in the house last winter, and when warmer weather came the germs of the disease were carried into the well and drank by another family. Thus another case where the work of the health officer comes to naught through the ignorance and indifference of the people.

PEOPLE are willing to pay big doctor bills to be cured when sick, but complain when paying very small bills to prevent sickness. Greater care is taken against the loss of property than against the loss of health. We are confronted with this fact in every attempt to forward the cause of sanitary science, and yet we know that more sickness results from ignorance, carelessness and removable causes than from any other source. A gentleman called at this office this week and stated that he believed the plumbing in his residence was out of order, that there were bad odors in the house, two of the family were sick, and he wanted to know what he should do. We gave him a list of the registered plumbers of the city and told him to select a plumber from the list and have him make an inspection of the plumbing and all the needed repairs. We also told him to satisfy himself that he had a good plumber and then, when he suspected the plumbing the least bit, to have his plumber make an inspection without delay. This was something new to the gentleman. He was innocently ignorant of the means of remedying the evils in his house and had not thought of securing the aid of a plumber, and stated that he would hereafter have his plumbing inspected by a competent plumber at least twice a year. This man will now be safe in this respect, and he sets an example all should follow. Remember it is the plumber only who can remove such evils. He has made this his particular business, and when the plumbing is suspected, have a plumber examine it at once; delay is dangerous. Having plumbing work examined at stated intervals is a good idea, for defects may not be discovered otherwise until the mischief has been done. Poisons can enter the house undetected except by tests made of the plumbing, and the little cost of having it tested will be repaid in the saving of expenses accompanying sickness.

PLUMBING, like any other business, is carried on for the purpose of making money. It is not engaged in for recreation. There is not much fun in it, and as a means of improving the health of the plumber, it is not highly recommended. As a means of making money, it is not the best on earth, but those who have plumbing work to be done should realize that the plumber must be paid for doing it. There is this difference, however, between plumbing and other kinds of business: While the object of all is to make money, the plumber must remember that in his business he has in his keeping the health of the household. He can put in a job of plumbing that will be healthful and stand as a security against the ills of defective work; or on the other hand he can put in such a job as will bring in the family all the ills accompanying the poisons of sewage and the decay of matter. Fos this reason the public does not stand in relation with the plumberf as it does with those engaged in other work; and for this reason the public should aid the plumber in furnishing the best material and doing the best work. This is easily done: Pay him fairly for his work. If a tailor is beaten down in his prices on a suit or

clothes, it may be set down that the loss will be made up in cheapening the suit in some particular. People are inclined to sell that for which they are paid. No man can succeed in business who gives his profits away. The public certainly know this and should consider it in procuring work of any kind done; but if there must be a cut anywhere, do not make it on plumbing. Anything else cheap can be better afforded. Regardless of all that is said to the contrary, plumbers are not robbers, but their business must be governed by the laws that govern all others.

City Health Officer Bodenius, of Madison, Wis., was recently assaulted by one Charles Hyland who became enraged at the health officer, while he was trying to stop the spread of diphtheria, by fumigating the premises of Hyland's sister. For the assault Hyland was given three months in jail. This bit of information is interesting in showing the little sense some people have regarding the means employed in the promotion of public health. In this city there was a case of scarlet fever in a certain residence, and the proper officer had a signal put up warning the public of danger. This signal was torn down by the family, leaving no notice of the contagious disease within. There are many other such cases and they all show how poorly our health officers are supported in their endeavors to prevent the spread of disease. It would not be supposed that such violations of the law in such important matters would occur, but they do occur constantly, and some severe measures should be taken to prevent them. Any one who would so willfully expose the public to dangers of this kind should be dealt with most severely without ceremony or delay.

If the prices of plumbing work fall below cost, it will be wholly the fault of the plumbers. There is no need of cutting prices whatever. It is not done in the interest of any one, but to the injury of all.

SEWAGE DISPOSAL AND WATER SUPPLY.

A committee of the Aldermen of Boston recently set out to inspect the method of sewerage and street paving in several of the Western cities. One might at first thought consider it useless for Boston to investigate any city with a view of learning anything that would be useful in giving Boston a better system of sewerage, street paving or street cleaning, but on second thought the wisdom of this movement can be seen. Boston is a comparatively old town—very old compared with some of the young cities in the West. Its streets and sewerage were planned before the art of making cities had advanced to its present position. Many of the approved methods now found in the younger Western cities had not been thought of. The cities that have sprung up in the bounding West, practically started where the older cities in the East stopped as regards sanitary equipments, and in these young cities can be found many important lessons for their Eastern sisters.

There are two things in the report of the committee worthy of consideration: One is that "in almost every instance the system of sewerage was so constructed as to empty the sewage into the river or lake on which the city was situated and from which water supplies were taken, but at a point miles distant and below." Following this so closely that it may have been considered a result, the report states that the obtaining of pure water presents a great problem, the solution of which will cost millions of dollars. These are two serious facts that confront the people to-day, the evils of which are becoming alarming from year to year. The first method of sewage disposal that presents itself is the discharge of it into some body of water. As a result we have the streams of the country on which our cities are principally situated, polluted by the cities along their banks discharging their sewage into them. It may be "miles distant and below," but there are other cities still below whose water supply is taken from the sewage-polluted stream. We are told that the dilution of sewage by the water in the stream renders it harmless. We are given columns of literature on subsidence, precipitation, dilution, nitrification and the like, but when sewage is seen floating about the intake of water supplies, we feel that we have need for something more than literature and the treatments of sewage which will apply in a certain case and with the population of but one city considered. There has been no line drawn fixing the point at which sewage-polluted water is safe or unsafe for potable purposes. No one yet has been able to tell what amount of sewage could be admitted to a certain quantity of water without rendering it unfit for domestic use. No one ever can tell, for the changing conditions of place and climate, sun and shade, aeriation, etc., are factors no one can calculate. The local conditions even change so that on which calculations are once made are very different from that of other periods. The fact is that the only safe rule to follow is to admit no sewage whatever into water designed to be used as potable water. The best authorities so strongly condemn the pollution of water by sewage that they assert that the fact that any sewage has entered any water should of itself condemn that water. The only safe rule to follow is to keep sewage entirely out of streams and bodies of water from which water supplies are taken. Sewage should not be drained into any water. That is not the place for it. Water is not the great purifying agent that it is claimed to be by some. It is a solvent but it tends to a great extent to arrest decay, and retains poisons from decaying matter a long time owing to slow decomposition.

The system of draining sewage into our streams and lakes is all wrong. The correct theory of sewage disposal is destruction and will remain so until a process is discovered by which it can be wrought into harmless substances. This has been done on a small scale, but has not been practical for the use of large cities. Our Western cities are generally well sewered, but the disposal of sewage is wrong and its evils will shortly become so great that the severest necessity will demand a different disposal. The proper disposal of sewage is a problem that has not yet been solved, but it has been fully demonstrated that its disposal through water channels is contrary to the first principles of hygiene and destructive to the best conditions of health.

NOTES AND NEWS.

The N. Y. *Medical Times*, in reference to rubbing the walls of rooms with bread for removing infections, says (according to *Wien Bua Ind. Zeit*), bread will not only remove dirt and stains, but will also eradicate all disease germs and seeds of contagion. It mentions experiments with rooms which had long been occupied with contagions maladies. After a single careful rubbing, three out of twelve walls were found free from germs. After a second treatment, every wall was pronounced clean and disinfected. The process is cheap, unskilled labor can apply the bread. An ordinary room was cleaned completely with about sixty cents worth of bread.

An important discovery has apparently been made by M. Mandereau, of Besancon, which, if corroborated, will permit of the easy recognition tubercle in cattle. M. Mandereau found tubercle bacilli in the aqueous humour of the eye in more than a score of bovines suffering from various stages of the disease, even in the very early stages, it appears.

Landlords in England, the courts have held, are liable for damages in case of disease of tenants from defective drains, &c., on condition that the landlord had warranted the premises to be in good sanitary condition.

The notification of infectious disease is making fair progress in England. Fifty-five "authorities," with a population of over 6,000,000, now require measles to be reported; whooping cough is notified in 14 districts. It is now suggested that influenza, or it appears the grib, be included as within the notification act.

The National Health Society of England has just received a contribution from the Duke of Westminster of £100, and an increase in his annual subscription of £20, in view of the useful work of the Society in inaugurating, a system of lectures among the poor on house sanitation, &c.

Dr. Praussnitz has found tubercle bacilli in the dust of a number of compartments of railway carriages in Germany which had been occupied by consumptive patients.

A movement is on foot for the establishment of a Society of Hygiene in Havana, Cuba.

It has been asserted in the Paris Academy of Medicine that tobacco smoking is the real cause of the depopulation of France.

The *Medical Times and Register* says: Patent medicines containing arsenic and phosphorus are responsible for many cases

of fatty degeneration of the heart, and nearly every soda-water purveyor in the country dispenses beverages containing phosphorus compounds.

Bacon said, to be free-minded and cheerfully disposed at hours of meate and of sleepe and of exercise, is the best precept of long lasting.

Leisure for men of business, and business for men of leisure would cure many complaints.

Experiments made 20 years ago on the non-conducting properties of boiler scale gave astonishing results. The effect of the scale accumulation is given as follows: 1-16 inch thick requires 15 per cent. more fuel; ¼ inch 60 per cent. more fuel, and ½ inch thick 150 per cent. more. To produce steam at 90 pounds pressure, in a clean boiler, only 355 degrees of heat are required, but with heavy scale this temperature must be increased 200 to 300 degrees. For ½ inch of scale the heat must be 700 degrees, or almost a low red heat for the iron. Professor V. B. Lewis, F. C. S., F. I. C., after discussing the nature of boiler deposits in a recent lecture, recommended the following means of preventing these dangerous accumulations: 1. Filtration of condenser water through a coke column. 2. Free use of the scum cocks. 3. The use of water of considerable desnity rather than of fresh water. 4. The use of pure mineral oil lubricants in the smallest possible quantity.

A KANSAS CITY PILGRIM IN CHICAGO.

BY DENT YATES, SANITARY PILGRIM.

Partly with a desire to see more of the great city of Chicago, and partly because the railroads were imitating the Chicago plumber and cutting rates where there was no special need of it—but I went mostly for the sordid greed of gold and to open an office to push an invention of mine—I found myself once more in this bewildering city. One of the first plumbers I happened to to run against was a regular old timer Mr. William Chappel. Chappel has been in Chicago a long time, and while he is something over 55 years of age, he can trot almost any of the younger fry of plumbers a heat and come under the wire first, either on a foot race or a plumbing job. Chappel's work consists a great deal in day work, and good big jobs at that, and that is a good way to accumulate rocks.

I also called on Andrew Young, the war horse of the plumbers' rights, and the bitter foe of smoke, sewer gas, and snide plumbing. When I visited Chicago a few years ago there were three great nuisances, that forced themselves on the notice of a stranger as well as a resident. The greatest of the trio was smoke. The splendid stone front buildings that looked clean and beautiful while being erected, were in a very short period so begrimed and dirty-looking that it detracted most of their beauty. People who wore white shirts used to have rich black veins running through the bosom like Italian marble; and ladies who wore white dresses through the streets were considered either semi-lunatics or strangers, or both. But things have changed now; the air is freer from smoke and new buildings look new and as large as they do any where else, and a great deal of credit for these results is due to Andrew Young.

The other two nuisances I speak of were over-head wires, which are now all underground enclosed in lead pipes and giving employment to the meek and lowly plumber to some extent. And last, but not least, the famous, or rather infamous, Chicago river. They have lately taken to diluting this beautiful stream with water, so it is out of sight or rather of smell to what it used to be.

I met M. J. Corboy, who, along with P. Nacey and E. Baggot are considered the Big Three of the plumbing trade in Chicago by some folks. Corboy is a business man from the word go. There is no foolishness about him. He does an immense business, good work, and looks to me as if he worked a little too hard; but that is a common fault with successful plumbers, comic paragraphers to the contrary notwithstanding. Corboy has a foreman, William H. Tilton, who wears a handsome black mustache and good clothes enough to be mistaken for a popular tenor; but he is a great hustler, has many friends, and together with Charley Hulburt of Baggott's and Murphy of Nacey's they make three of a kind that would beat two pair most anywhere.

An old friend of mine, Dave Wilson, is up on Milwaukee avenue in the firm of Wilson & Wilk. He is doing a good deal of work and has a nice place.

I also called on J. J. Wade and found him looking healthier and feeling more prosperous than he was ever before. He has several specialties in the plumbing line that he is pushing and quite successfully, too.

My old friend Belden, of the N. O. Nelson Manufacturing Company, of St. Louis, has an office and show room with Wade, and is having good success in town.

While I was in Chicago I hung out a good deal at L. Wolff's show rooms at Dearborn street, which are presided over partly by that prince of good fellows and salesman, Will Keeler, and also by Messrs, Verity and Larn. Verity is a relentless rusher for city trade also. The way that outfit sell plumbers specialties is a caution. I also met Mr. L. Wolff, himself, one of the most genial and pleasant as well as unassuming manufacturers I ever had the fortune to meet. Keeler took me all through their factory. They have another large one over on Carrol and Hoyne avenues, but I cannot enter into details of these vast workshops, partly because of lack of space and partly because folks would think I was giving Wolff's folks taffy to get an extension.

I was out at the World's Fair site with John Beesley. John is putting in pipe by the car load in the department of Mr. Alexander and under the general supervision of W. S. MacHarg. I understand that it is the intention of this eminent sanitary engineer to conduct all the World's Fair sewerage to one point, where the sewerage will undergo chemical treatment and be reduced (to use one of Ex-President Cleveland's expressions) to a condition of inocuous deseutude. How MacHarg intends to dispose of the sewage afterwards I did not learn, but you can rest assured that under this skilled engineer's management that this problem, as well as almost any other one he undertakes, will be satisfactorly solved. "Au Reservoir," Bong sewer, Good bye.

VENTILATION AND HEATING OF HALLS OF AUDIENCE.

(Continued from Page 165.)

As a means of ventilation, natural agencies, so called, are generally first employed for producing the required air movement. In other words, escape of air from the room is made dependent upon the difference in density between the air in the room and vent flue and that out of doors; the density of the air being directly dependent upon its temperature. Consequently on a warm day, when the air within and without the building is very nearly of the same temperature, but when the maximum ventilation is desired, there is the least tendency to air movement in the flue. On the other hand, on a cold, windy day, when there is excessive inward leakage around window frames and doors and through walls, the vent flue is working at its best.

By the introduction of a stove, steam coil, or gas jets at the base of the flue, it may be rendered much more positive in its action, nevertheless, will be greatly affected by changes in outdoor temperature and the direction of the wind. Evidently, then, in order to maintain absolute control over the system, absolute and positive means must be employed. Such means must, of necessity, be mechanical.

To quote Robert Briggs, a man of large experience in practical ventilation and heating: "It will not be attempted at this time to argue fully the advantages of the method of forced ventilation, by impulse, through mechanical means—the superiority of forced ventilation, as it is called. This mooted question will be found to have been discussed, argued and combated on all sides, in numerous publications, but the conclusion of all is: that if air is wanted at any particular place, at any particular time, it must be put there, not allowed to go. Other methods will give results at certain times, or seasons, or under certain conditions. One method will work perfectly with certain differences of internal and external temperatures, while another method succeeds only when other differences exist. One method reaches to relative success whenever a wind can render a cowl efficient. Another method remains perfect as a system if no malicious person opens a door or window. No other method than that of impelling air by direct means with a fan is equally independent of accidental natural conditions, equally efficient for a desired result, or equally controllable to suit the demands of those who are ventilated. In

all mechanical appliances that is simplest which most positively and directly effects the purpose in view, and in this matter of supplying air it may be claimed that the process of impelling it, when and where wanted, is at once the most certain and efficient, and that the fan (in its form of arotating wheel with vanes, for large uses) is the simplest and the readiest machine for impelling air. It will not be attempted at this time to discuss the theory of Rotary Fans. The fan itself will simply be accepted as one of the recognized appliances in the construction of ventilating apparatuses, available with other mechanisms in established forms and defined types for American practice."

These are strong words in favor of the fan as a means of ventilating. Too often a fan is looked upon as an expensive luxury, while, in fact, the power required to move a given volume of air with a fan is vastly less than that necessary to produce the same air movement through the medium of steam coils. The fan may be unhesitatingly claimed to be the most economical mechanical device for the movement of air.

In use, the fan may be applied in either of two ways. First, and generally most natural to an inexperienced engineer, is its application as an exhauster, merely to withdraw from the room the vitiated air. Such an application, however, at once precludes any practical and efficient combination of the heating and ventilating systems. When employed as an exhauster, its operation necessarily causes inward leakage to the room from all sources. The leakage of cold air around window frames is often so great as to be decidedly perceptible and disagreeable. But far more objectionable is the fact that when water-closets are placed in the basement the air is liable to be drawn directly from them.

The attempt is often made to heat the air by causing it to be drawn through openings in the outer walls and across steam heated surfaces. The fact is, however, that a change in the wind or temperature on the opening or closing of windows and doors often has a very serious effect upon the efficacy of this arrangement.

If, as a matter of economy, in utilizing the ascensive force of the air drawn from the room, the fan is placed in the attic, it is very inconvenient to transmit to it the necessary power for driving, unless electricity is the agent. If such is the case, there still remains the probability of noise and jar while in operation.

Of course, as is often the case, the fan may be placed in the basement upon rigid foundations. But this necessitates drawing the air down against its will, and generally requires a large general vent shaft for its subsequent discharge above the roof.

All systems of ventilation by exhaustion, whether by natural, induced or mechanical means, seems to be a result of the original exigencies of the case; that is, they primarily aim to remove the foul air and then to supply in its place pure fresh air. But sad to relate, this latter part of the system is generally disregarded, and air has an opportunity to enter the room from any source, as already pointed out.

As it is fresh air that we want to breathe, is there any logical or sensible reason why the primary object of a system of ventilation should not be to supply this air, letting the discharge of foul air take care of itself, because of the fact that it must escape to make room for the incoming fresh air? Such a system is known as a "plenum" system, the air supplied to the room being under pressure, sufficient to compel the foul air to be discharged.

It is at once evident that such pressure can be only produced and maintained by mechanical means, and the fan has already been shown to be the most efficient agent for this pnrpose. By this means the system is at once made *positive* and is unaffected by wind and weather. With a properly arranged system of ducts the air is of necessity thoroughly distributed; as Briggs so tersely states it, it is "put there, not allowed to go."

As all the air entering the rooms must have passed through the fan, it is a very simple matter to control absolutely its volume, temperature, quality and humidity. The volume is dependent solely upon the size of the fan and the speed at which it is run. The temperature of the air is likewise dependent upon the size and construction of the heater and the steam supply. To secure air of the best quality, due attention must be given to the surroundings. In cases where a building is located in an open lot, the air may be readily drawn through the cellar windows; but in most instances it is necessary to draw from above the roof line if the purest and clearest air is desired. In all cases attention should be given to its cleanliness, as in the large cities there is a remarkable amount of fine dust and carbon floating in the atmosphere.

Screens of cheese cloth or finer material, or even of cotton batting between open mesh screens, will serve to cleanse the air if it is drawn through them, but their area should be large to prevent undue resistance and they should be removed and cleansed at intervals.

As a component of the plenum system all leakage is outward, so that with a slightly opened window there is but slight opportunity for inward currents. The actual necessity of vent registers becomes less, and in fact in rooms containing but few occupants they can be entirely omitted, as sufficient opening for escape is found in cracks and crevices around doors and windows and through porous walls. The old experiment of blowing out a candle through a brick is a good illustration of the possibilities of ventilation through walls.

To one who has always looked upon a vent register as a necessary adjunct of a ventilating system (and such it must be with an exhaust system) the omission of vent registers with the plenum system often appears in direct defiance of all principles of ventilation. But, if it can be shown by actual test that a sufficient amount of air for the requirements of the inmates is forced into the room, no sane man can doubt that it escapes, even if no register and flue is provided for this purpose.

Hundreds of manufactories are heated upon this principle with never a thought of any ventilating flues, and many offices and similar buildings in which the system is in use are provided only with inlet registers. There is evidently a considerable saving in the expense of introducing the system when the vent registers and flues can be omitted. In all halls of audience, as here considered, vent flues are requisite unless there can be an excessive window area, or discharge is made into corridors or adjacent rooms.

The style of apparatus employed—consisting of fan, heater and moter of same type—is susceptible of many arrangements. In fact varied arrangements are generally necessary to locate the apparatus in the space too often allotted to it after everything else in the building has been provided for. Although the disc or propeller fan is both serviceable and economical for mere ventilating purposes, under the exhaust system when it works against slight pressure; nevertheless, for the plenum system it is practically useless on account of the increased pressure. The possible pressure that should be creatable at the fan varies from one-half to one ounce per square inch under the latter system, and requires for its production a fan of peripheral delivery type, *i. e.*, discharging from the periphery in a line at right angles to the axis of the fan. Such a fan may be used either with or without a case or housing. In the former style it is possible to make ready connections to distributing ducts, while in the latter there is especial economy in power but considerable difficulty in the matter of duct connections. In either style it is desirable to gradually deflect the air in its passage through the fan by placing a properly proportioned cone in the rivet of the fan with its axis coincident with that of the fan shaft. The floats or blades should likewise be curved, acting with their convex sides upon the air, conducing to efficiency and reducing the possibility of noise.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

There have always been incredulous people and there always will be. Nothing has been produced, no reform has been wrought, no improvement made in which was unqualified belief placed at once. The general progress to-day is years behind the age on account of disbelief and intolerance. Some one in advance of the general thought of the period conceives a reform, an improvement in some important affairs, or discovers something new and better than anything known; but this reform, this improvement, or this discovery is retarded in its development and use by unbelief and intolerance. There are those, and their name is legion, who not only disbelieve in everything new or out of the ordinary, that they cannot tolerate its encouragement or

an opportunity to test its usefulness or virtues. In all history the exceptions to this rule are rare. Tolerance is the handmaid of advancement, and what might become the triumphal car of progress, is, with intolerance, the trudging vehicle creaking along the laborious byways of toilsome life.

The subject of smoke prevention is not new. The fact that it is old and yet in the infancy of its usefulness is a sad commentary on the willingness of public thought and action to promote it as it should have been. Had intolerance and unbelief given way to a reasonable faith and encouragement, we would not to-day be fighting our way through smoke to a pure atmosphere. The advancement of this reform is fifty years behind the present age, and all on account of this intolerance, the greatest foe we have to the progress of the world.

Philosophy, science, and religion have struggled up the centuries through persecution, martyrdom and wars, littering the ages with the ruins of advanced thought, and to-day we condemn the unbelief and intolerance that held the best of all ages and all time by the throat and made its progress slow and toilsome while the world suffered the want of its good offices. In view of what has been and the struggles through which all reforms have gained recognition, we need not be unprepared to meet with opposition in this, one of the most important reforms of the present. Men have gone on from year to year all their lives producing smoke, and can see no reason why they should not continue to do so. The public has sat with its hands in its lap and smoke in its eyes and has never raised a finger in self protection. People think that because they have always suffered an evil they must continue to do so rather than violate old customs and advance a reform to its complete success.

As in the past, so in the present there are those who see ahead—as far as the smoke will permit them—and to relieve a smoke-begrimed public seek to abate the nuisance by providing the means for preventing smoke. These are met by the disbelievers and intolerant and the same old struggle between progress and the rut-lodged portion of humanity is on. This conflict has reached a plane in this country it has never occupied before. It has made a battle ground of nearly every city in the land, and the banners of the invading reform bear the aspect of triumph. The sentiment favoring smoke prevention is healthful and pretty general in all our larger cities. This sentiment is springing from the right source as it springs from the people. Societies are being formed, committees appointed, and the power behind officials is preparing to take the matter in hand. Enquiries for information regarding smoke ordinances, and smoke preventers come in from every direction, manifesting a strong sentiment favoring the abatement of the nuisance.

Everything must have a beginning. Time began once, and while the present does not boast of a smokeless atmosphere, it is taking the steps that will soon bring about the beginning of the end. The progress in this regard of a year has been marked. It has been gathering strength and from an unfailing source. When the people start in earnest to abate this great nuisance it will be done. The only trouble now is many want to wait to see if it is possible. They are tainted with that old intolerance which has cursed the world from the beginning. It is not possible to abate smoke without doing something towards that end. It will not abate itself. Those who produce it will not prevent it of their own accord. There must be a strong pressure brought to bear on them and it must come undivided. One person or a few cannot prevent this evil. The public generally must be interested and give its united support. We have seen the work of a few only partially succeed, when had they had the full support of the public—its moral and active support—men would not to-day see their property depreciated in value and their homes made black and stifling. Science and mechanics are in the field ready to aid in the conflict. They have demonstrated their ability to prevent smoke if given an opportunity. The duty of the public is to afford that opportunity; to make it possible for them to render the service they are able to give; to enforce the right of the people to be clean, comfortable and healthy. Could all people clearly recognize that these rights are violated they would surely be willing to give invention an opportunity to test the virtues of its devices. Let us have a chance to remove this evil.

HEATING BY HOT WATER.

In 1723 an expedition was sent to Greenland to search for a lost colony of Norwegians, supposed to be there, by the King of Denmark, of which Norway at that time was a dependency. It was in August of that year that Egede, in command of the expedition, while seeking traces of the lost colonists, came upon a group of remarkable ruins at a place called Kakortok, in the district of Julianeshaab, Southwest Greenland. This has since been identified as Alba in the East Bygd, which is spoken by the ancient German author, Dithmar Belfken, who tells us that in 1516 he met a Dominican monk in Iceland who told him about the state of Greenland. He told him besides, "several things about Sir Thomas' cloister, particularly that there was a fountain of hot water conveyed by pipes into all their apartments, so that not only their sitting rooms but also their sleeping chambers were warmed by it, and that in the same water meat might be boiled as soon as in a pot over the fire." This is also vouched for by Cæsar Longinus in his "Extract of Journeys and Voyages." These old ruins, the earliest traces of Europeans in the Western hemisphere, have been revisited as recently as 1888 by the artist Bradford, who also found the hot water spring, which he explains is of volcanic origin.

This is the first authentic example of the use of hot water for warming dwellings of which we have any knowledge, but notwithstanding that it appears to be the first, I believe it to have been only a clever adaptation by the builders of the monastery of a method of conveying heat which must have been already known to them. Guizot has proven in his "History of Civilization" that the modern world holds to the priests in the monasteries the preservation through the dark ages of the knowledge and the art of the dead civilizations of Greece and Rome, and their transmission to us. The better we become acquainted with ancient life the more we find that they knew, and the less we can claim as the invention of modern times; and it is not improbable that the men who could build those magnificent cathedrals without a mortgage were both able to appreciate the merits of hot water heating and to make efficient use of it by the aid of appropriate apparatus. There is an old town in Germany where there is a hot water spring, from which pipes are laid in every street and are connected to every house for heating them; and nobody knows when the use of hot water first began.

So much to quiet the objection which some make against hot water heating, that it is some new-fangled thing. I know of a house in Boston which has been most comforably warmed by a hot water apparatus for nearly sixty years, the pipes being of copper all brought from London in charge of the mechanics who set it up. One type of apparatus was introduced in England by Perkins, an American, early in the present century, and his system was patronized by Babbage, the celebrated inventor of the calculating machine, by whose aid long computations in mathematics were performed, as it were, by machinery.

Everybody knows that hot water holds its heat for a long time; those valuable people who are always trying to find out the why and wherefore of everything, the scientific men, have discovered water has the greatest capacity for heat of any known substance. Pound for pound, it absorbs more heat and holds it longer than any element; besides, it expands so much by heat that its weight is changed. The consequence of this is that if heat is applied to the bottom of a vessel containing water, the warmed and expanded water, being lighter, rises, and the colder, denser and heavier water falls, to be in turn heated, and thus a rapid circulation takes place. This fact is of the greatest importance in its bearing upon heating apparatus, for it is the cause of the rapid circulation whereby the boiler is prevented from becoming over-heated in any part, and on the other hand, of such a rapid change of the water in the heaters or "radiators" that they are kept nearly as warm as the water in the boiler itself. This is the case not only where the transfer of heat from the boiler to the radiators is considerable, as is the case in cold weather, but where it is trifling, even when the radiators are not sensibly warm to the hand. Heat at such low temperature as this tests most strongly the value of the system, and is another element to be added to those which proceed from high specific heat of water and its property of rapid circulation from the heat-absorbing to the heat-emitting surface. It may be well to explain how this low

temperature heating takes place. We are most comfortable in this climate in a temperature not lower than sixty-five degrees nor higher than seventy-five degrees. Inanimate objects of course have the temperature of the surrounding air, consequently all the objects in a room warmed to seventy degrees have that temperature. The temperature of the body is ninety-eight degrees, and consequently any object lower than that feels cold to the hand, for example, a marble table, a pair of tongs; so would stuffs and furniture were they not poor conductors and of low specific heat. It is plain that if the surrounding air acts upon objects to maintain them at the same temperature with itself, they must absorb heat from it, if colder than it, and conversely give up heat to it if warmer. Consequently, if there is no fire in the boiler the radiators will finally have the same temperature as the air surrounding them, but if they are a single degree warmer, they begin to impart the excess to the air. That is to say, the radiators may be at eighty degrees, and feel sensibly cold to the hand, yet be actually warming the apparatus, and keeping it at the point of comfort. There are many days in spring and autumn when the conditions are such that the least modicum of heat is desirable, just enough to remove an undefinable feeling of dampness or chilliness, when a few pieces of wood thrown into the boiler and lighted, and burning for a quarter of an hour, will bring about this result without the radiator giving out any sign of heat to the sense, except indirectly by their effect upon the surrounding air.

There is no method of warming which approaches hot water in this respect. The full meaning of this is that the system is best adapted to a changeable climate, and while itis capable of developing heat in large quantities, it is adapted equally as well to those frequent occasions when the smaller quanties of heat are almost too much; when, it is needless to say, the furnace and steam boiler is not to be thought of. A little fire in the former would be of no use, for it would, while it lasted, still be hotter than wanted, and the instant the fire was out the heating would cease. On the other hand, the hot water takes up the heat of a little fire slowly, and continues to circulate and emit the heat with a slowness corresponding to its absorption (owing to its high specific heat) long after the fire has vanished and the embers are cold. As for the steam heater, it has to be proportioned for the coldest day in winter, and, as there is only one such day it is too powerful for the other days, and nobody has ever discovered how to "take a reef in it." So it boils away and wastes coal and destroys comfort and health. We have seen how elastic the hot water system is in contrast with it; is any demonstration needed to show that its economy is no less remarkable than its efficiency and adaptability?—Frederic Tudor in "Heating for Health."

CONVENIENT TO HAVE ABOUT.

For paint to stick to zinc, use the following wash: Chloride of copper, one part; nitrate of copper, one part; sal ammoniac, one part; water 64 parts. This coat is left for 24 hours before applying to the paint.

Silver or electro-plated spoons and forks which have been blackened by contact with the sulphur of cooked eggs can be cleaned by rubbing them with very fine salt.

It is asserted that the antiseptic effect of corrosive sublimate solutions is greatly increased by heating to a temperature of 100° F. and higher, a 1 to 10,000 solution at this temperature being equal in germicidal efficacy to a cold solution of 1 part to 500.

Asphaltum is found to make an excellent material for sea walls exposed to surf. It is soft in hot weather, but hardens up when the sea washes against it.

Mixing oil gas with coal gas is said to have an excellent effect upon the illuminating and heat-giving properties of the latter.

Cold copper wire offers less resistance to an electric current than a hot wire. The resistance increases at the rate of about one-fifth per cent. for each Fahrenheit degree of rise in temperature.

Enquiries are being made in *Indian Engineering* as to whether coal tar or Burmese "earth oil" forms the best preservative for woodwork. Having tried both, observes *Invention*, we may state that when wood is exposed to air only, the earth oil is both cheaper and less offensive. For wood wholly or partially buried in the ground, or inserted in brickwork, the coal tar is much superior.

Hot cider-vinegar will remove paint stains from window glass, or nearly full-strength oxalic acid used with a swab will produce the same effect. In using the latter, care must be taken that it does not touch the hands or the paint on the surrounding woodwork.

If marble is discolored by grease or any other kind of stain, mix two parts of common washing soda with one part chalk and one of ground pumice stone. Make sure that all are finely powdered, and then make into a paste with water. Rub it well over the marble, and an hour or two later wash it off with plain soap and water. Another way of cleaning marble is to mix whiting and curd soap to a paste. Spread and leave for a couple of days, then wash it off, and the marble will be as white as possible.

The nitrate of lead is the cheapest disinfectant known that fulfills its intent. It does not, however, prevent putrefaction. The chloride of lead is much more effective in all directions. It is made by dissolving a small teaspoonful of nitrate of lead in a pint of boiling water, then dissolve two full teaspoonfuls of common salt in eight quarts of water. When both are thoroughly dissolved pour the two mixtures together, and when the sediment has settled you have two gallons of clear fluid which is the saturated solution of the chloride of lead. A pound of nitrate will make several barrels of the liquid. The nitrate of lead costs from eighteen to twenty-five cents a pound retail.—*Rhode Island Board of Health Report.*

INSPECTION OF WATER SUPPLIES.

In our editorial last week says the *Engineering Record*, attention was called to the necessity for constant regular skilled supervision and inspection of the sources of a general water supply to prevent discomfort or danger to the consumers, and to the desira bility that a water engineer should be able to make at least the simpler chemical and microscopical examinations of water which are requisite for positive determinations of pollution. It is very true that this determination may often be made by simple inspection.

As Professor Drown remarks, to determine whether or not a water has been polluted by sewage, a chemical analysis is sometimes insufficient; sometimes it is superfluous. It does not need a chemical examination to decide whether a stream has been polluted by sewage when one can see the sewage flowing into it. In such a case it may be useful to determine the nitrogen compounds at different points in order to know the mode and rapidity of the changes which they are undergoing, and thus settle the question as to the urgency of the need for special preventive measures, but this adds no strength to the evidence of the actual fact of pollution.

The dangers which arise from sewage pollution of drinking water are now generally, although rather vaguely, understood by the public, and where such pollution can be demonstrated, and a remedy at a reasonable cost pointed out, the course to be pursued by the engineer is usually sufficiently evident. There are, however, other sources of trouble in a water supply to be guarded against as well as those due to the bacteria of the specific diseases, and it is to the need of the constant skilled inspection to prevent some of these that we now wish to call attention.

Of late years it is becoming evident that there are a number of microscopic plants and animals, not directly connected with sewage or specific diseases, which may, under certain circumstances, multiply in a general water supply to such an extent as to make the water unpleasant, or actually unfit for use. The report of Mr. G. H. Parker upon the organisms, excepting the bacteria, found in the waters of the State, contained in the special report of the State Board of Health of Massachusetts, on the waters of the State, recently published, is especially interesting from this point of view.

The most interesting relations of these organisms are to the odors and tastes of the waters in which they flourish. The connection is not a necessary one, but odors in general water supplies, and especially in stored water, appeared to be almost exclusively due to certain algæ and fungi, or to fresh water sponges. Generally speaking, they are rare in ground waters and most frequent in standing surface waters, freely exposed to the light, as

in ponds or open reservoirs. At present, our knowledge of the circumstances which favor or retard the growth of some of these odor producing organisms is very imperfect, and each general water supply requires a special study by itself. This study should be continuous throughout the year, to determine the forms most prevalent at different seasons and in connection with varying conditions of turbidity and odor. It requires the use of the microscope, but elaborate and special modes of preparation such as bacteriological analysis demands are unnecessary, and the study of the succession of forms is a most interesting one.

Algæ and minute animals are found in almost all water supplies which are exposed to the light, and, as a rule, cause neither annoyance or danger. It is only under special circumstances of food supply and temperature that a few of them can multiply with great rapidity and produce unpleasant consequences. Sponges and small animals are found especialiy in water mains, for their food must be brought to them, and they thrive best where there is a gentle current. Where there are no algæ the sponge dies for want of food and the products of its decomposition may be disagreeable. The precise location of growths of sponge in the mains is sometimes of interest, and may be ascertained in the summer and autumn by the presence or absence of sponge spicules at different outlets by means of the microscope.

In deep reservoirs very marked differences may at times exist between the superficial and the deeper layers of water as to the presence of impurities of odors. In warm weather the water may be for a time clear, comparatively pure and free from odor, while the bottom water may be offensive and this impurity may either gradually extend to the upper layers, or by a sudden storm or great change in surface temperature, the mixture may be made rapidly, and give rise to an explosion of grumbling among the consumers. In such cases the water engineer should know by examination samples at regular intervals the condition of the deeper water as well as that of the surface and should not be taken by surprise by a sudden change. He may, in fact, if he has timely notice, prevent any serious trouble by getting rid of the deep, offensive water before it has a chance to get into the supply mains.

In the report of the Massachusetts State Board of Health, above referred to, may be found numerous illustrations of the changes which different water supplies undergo at different seasons, and the importance of continued systematic observations of these changes. Where such observations are made, under the direction of a central State authority, it may be said tbat it is of less importance that the local engineers should also make them, although even there we should think that each one would wish to study his own field of work for his own satisfaction; but in all other states the continuous inspection, which is so important, must be made either by, or under the immediate direction of, the local water engineers.

No occasional examinations, chemical or microscopical, made by experts, can take the place of such inspection made by one who is thoroughly familiar with the local conditions, and who has an immediate personal interest in securing at all times the best conditions for the work which is under his charge.

THE DENT YATES ICED WATER APPARATUS.

A few weeks since we mentioned the above apparatus briefly, as it was new to us then, and we awaited its trial at the Fair Building in this city. It now seems to us every architect who is called upon to equip the modern, large building, with the appliances in keeping with the times will appreciate the advantage of the apparatus here described, which is intended to and does produce better results in its line than anything yet devised.

The problem of satisfactorily supplying the massive building of to-day with cold drinking water has been given much thought, but so far, with no result but to cling to the time-honored ice cooler, where microbes and bacteria from the impure ice make merry sport in the water. The untidiness of the old way, the waste of ice and expense of frequently replacing it, the failure of water to follow the pressure of the faucet because of empty tank, are all annoyances that need no elaboration here. Contrast with this the new method which has been demonstrated to be a complete success in every instance, and no building which has adopted it but has good words to say for it. This plan is simple, but effective, for the purpose of cooling water which never leaves the pipes from the water mains of supply tank until drawn ice cold from the faucet for drinking. The ice is placed in contact with the pipe coils in the cooling tank in basement and needs no further attention until it is exhausted. The cold water from the melting ice and the waste water from the drinking fountains, on each floor, passes into the auxiliary tank alongside the first and is thus made to do service in reducing the temperature of the water before entering the cooling coil proper. In this way practically every unit of cold is utilized and no cold-giving power is lost.

In its circuit of the building the water is kept witin one or two degrees of the same temperature as when leaving the cold coil in the basement. At the Fair building, in Chicago, where it has just been put in operation, the water drawn from the faucet most remote from the cooling tank was 39 degrees. This in a building visited daily by 125,000 people, with 2,700 employes, and with a consumption of 20 pounds of ice per hour, as opposed to a previous use of 100 pounds per hour, producing a temperature of 43 degrees.

This is in no sense an experiment, and the truth of all that is claimed can be substantiated by inquiry of The Fair, general retail store, Chicago, to be 18 stories when completed, the Board of Trade building, eight stories, Kansas City, and arrangements have been made for its introduction in the World's Fair buildings, Chicago, and the Temperance Temple, 16 stories high, Chicago, and many other buildings throughout the United States. This is a wonderful record when the fact is considered that only a start has been made to introduce this system in a general way for the past few months. Mr. Yates, the inventer and owner of this apparatus, puts it in buildings under a strict guarantee and bond that it will do all that is claimed. Communications addressed to the home office and manufactory, 20 East Ninth street, Kansas City, or to room 401 Stock Exchange, 167 Dearborn street, Chicago, will receive prompt attention.

REVIEWS AND NOTES.

We are in receipt of sample pages of Funk & Wagnalls' Standard Dictionary of the English Language. We have on a previous occasion called attention to the preparation of this great work. We have had some correspondence with the publishers and are able to testify to the care, labor, time, means and efforts put forth to make this dictionary a perfect and reliable work. It will not consist simply of a vocabulary alphabetically arranged, but will comprehend a philosophical, systematic, and logical presentation of the English language in a convenient, and permanent form. A partial list of the one hundred editors employed in this work shows with what discriminating care the various departments have been assigned, and no greater assurance of the reliability of the work need be given. One example will suffice to show that the best have been attended. The department of handicraft terms is under the editorial direction of the well known Professor Robert Grimshaw, M. E., Ph. D., the author of many popular books. Other editors stand as high in their special departments, and the work cannot fail to meet with universal commendation. The price of the work when completed (about January 1892), will be $12 in a single volume and $14 in two volumes; but to all persons who will sign and return the acceptance blank below, and make a payment of $1, only $7 will be charged, in single volumes, and $9 in two volumes. The firm is perfectly reliable, and this is an opportunity to get a valuable work at nearly one-half its worth. Following is the acceptance blank:

Messrs. Funk & Wagnalls, 18 and 20 Astor Place, New York:

I accept your offer for a copy of your Standard Dictionary of the English Language, and herewith forward you one dollar in advance payment for the same, and will forward you the remaining six dollars when you notify me that it is ready for delivery. It is understood that if I am not satisfied with the work I shall be at liberty to send it back within three days after I receive it, and you will return my money.

Date.....Signed.....

P. O .....State .....

Mr. H. W. Perce, manager of the Institute of Building Arts in Chicago, sends us with his compliments a catalogue of the

Institute. The growth of the Institute under the ownership and direction of the Illinois Chapter of the American Institute of Architects has been so great that the value of this catalogue to the general public became apparent. It is a handsome and well arranged catalogue and not an advertising scheme. It contains a diagram of the building, list of members of the I. C. A. I. A., a general outline, special features, meetings, inspection day, bureau of typewriting and stenography, bureau of information, draughtsmen bureau, classified list of exhibitors, etc., giving location, section and description of exhibits.

We have received a catalogue of the Mouat Hot Water Heater from the Detroit Hot Water Heating Company, Detroit, Michigan, with the name of James B. Clow & Son, Chicago, as sole Western agents. The catalogue sets forth the merits of this heater in a plain and direct way, and illustrates fully its mechanism. Economy, durability, simplicity, healthfulness, safety are claimed for it, and it has as fine recommendations as can be obtained anywhere. Besides illustrating and describing the heater, the catalogue contains information regarding hot water heating and related subjects. The manufacturers are to be congratulated in securing the services of Messrs. Clow & Son as their agents, for their business reputation will add greatly to the sale of the heater.

FOR THE DIGESTION.

Remorse of conscience doesn't begin to gall the sinner real hard till after he is found out.—*Galveston News.*

The right kind of religion doesn't mean twenty-five cents a year for missions and turkey for yourself every Sunday for dinner. —*Ram's Horn.*

There is one excellent thing about these sensational preachers, they keep their congregations awake during the sermon. And that is something.—*New York Recorder.*

Harry (at the ball)—You look bored and tired, old man. Jack —Well, who wouldn't? I've been swinging dumb bells all the evening.—*New York Herald.*

"Lady barbers, indeed," his wife exclaimed, with a contemptuous sniff. "I'd like to know how such an idea as that ever originated." "I believe," replied her husband, "that it has been traced as far back as Delilah."—*Washington Post.*

It's the heiress' won't and her father's will that keep the aspiring young man mentally occupied.—*Washington Star.*

It is a mistake about it being unhealthy to sleep in feathers. Look at the spring chicken and see how tough he is.—*Richmond Recorder.*

If those patent electric corsets come into style young men will have to be very careful about applying the arm-atures.—*Binghamton Republican.*

Totling—"Well, I hope your new company is getting along swimmingly." Dimling—"It is. We watered the stock at the last directors' meeting."—*Epoch.*

McFingle—"Did you have much of a time with the boys last night?" McFangle—"Time! Well, I guess! You ought to have had the headache I woke up with this morning!"—*Boston News.*

"Where does this milk come from, anyhow?" asked Miggles. "Cows, I fancy," said Wagg. "That accounts for it," said Miggles. "Cowes is a famous watering-place."—*Harper's Bazar.*

Mrs. Worrit (on excursion boat)—"O, this crowd makes me sick and the band makes my head ache!" Mr. Worrit—"Well, dear, you would go out to enjoy yourself. We never can have our fun without some drawbacks, you know!"—*Puck.*

A man imagines that he has lots of fun in telling how difficult it is for even a woman to find her way into her own pocket, but all the varnish comes off the laugh when he begins to remember how easily she gets into his pockets.—*Philadelphia Times.*

Mistress—"Well, Bridget, what is it? Have you dusted the parlor already?"

Servant (recently imported)—"Dust the parlor, is it? Faith an' everything's all covered with dust now."

"Did the plumber come down to inspect the pipes this morning?"

"Yes."

"What did he say?"

"He said there was nothing the matter, but he could very soon remedy that."—*N. Y. Sun.*

PLUMBING NOTES.

James Fitton, of Wheeling, W. Va., has secured the plumbing contract for the big Memorial hall at Trenton.

The new brass works at Buchanan, Mich., have gone into operation, and the factory for the manufacture of plumbers' supplies will shortly be running.

Plumbers in several cities are pressing upon the Councils the importance of ordinances regulating plumbing. In some success is assured, but in others the councils know too much and cannot see why plumbing should be regulated by ordinances any more than painting and horseshoeing. A change of council would be most sanitary in such cities.

The annual picnic of the St. Louis plumbers occurred last Thursday. We are pleased to acknowledge an invitation to the picnic, but regret our inability to attend. The St. Louis plumbers know how to have a good time, and when they set about it always succeed. They are right to the front in everything, and we can safely state that their picnic was a success in every particular. We know something of the hospitality of St. Louis, and of her plumbers in particular, and hope that some time early in the future we may have the pleasure of paying them a visit. In the mean time we will state that the latch string of the Sanitary News always hangs out.

Thomas Dunne, of the city of New York, has patented a new improvement in laundry tubs. It consists of a tub having an overflow in its transverse central partition with openings placed at the upper end of the overflow channel in each partition. The lower end of this channel is connected with an outlet formed in the bottom of the tub, and is connected with the sections of the tub by suitable openings. The object is to provide a strong, durable tub, simple in construction, and requiring short plumbing connections.

Alfred Tily, a well known master plumber, of Syracuse, N. Y., and for 30 years engaged in the plumbing business of that city was drowned in the Erie Canal, Syracuse, N. Y., on the night of August 10. Mr. Tily, with a friend, had been driving along the canal tow-path when the tow-line of a passing canal boat swept his horse and carriage, with the two occupants, into the canal.

The J. L. Mott Iron works have issued a series of catalogue sheets showing a variety of forms of water closets, urinals, and bath tubs which they manufacture. The illustrations are handsome and are accompanied with descriptions, sizes, prices, and other matters of interest so the trade.

We still hear complaint of the evils of cutting prices. This evil will continue as long as the plumbers will submit to it. The way to stop it is to quit square off. Have an understanding about the matter and stick to it.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Adams and 75th street, F. Fisher, 7446 Cottage Grove ave.
966 Armitage ave., P. Gow, 858 N. Rockwell street.
6004 Aberdeen street, J. Bain, 6338 Justine ave.
6148 Aberdeen street, Killian & Co., 333 22d street.
58 Augusta street, C. Breyer, 833 Milwaukee ave.
1064 Albany ave., C. Kostlevy, 218 W. Eighteenth street.
5734 Aberdeen street, C. Kostlevy, 218 W. Eighteenth street.
103 Bremer street, Binder, Barrett & Binder, 49 Franklin street.
584 Blue Island ave., C. Breyer, 833 Milwaukee ave.
7237 Center ave., W. Johnston, 652 65th street.
Center ave. S. of 71st street, W. Johnston, 652 65th street.
44 Curtis street, A. A. Campbell, 842 W. Madison street.
5310 Dearborn street, E. & T. Sanford, 5103 State street.
4109 Drexel boulevard, J. Harvey, 414 39th street.
105 Division street, C. Breyer, 833 Milwaukee ave.
244 and 307 Erie street, Nelson & Cederholm, 87 W. Ohio street.
4119 Emerald ave., M. Stack, 723 Root street.
9215 Erie ave., Brunt Bros., 9115 Erie ave.
45th street and Champlain ave., W. Woodley, 366 45th street.

Fairfield ave., S. of 16th street, Steiner & McFarlane, 918 W. 21st street.

374 14th street, Chas. Uher, 524 W. Eighteenth street.

48th street W. of Wallace, M. Stack, 723 Root street.

51st street W. of Homan ave., M. Stack, 723 Root street.

412-414 and 418 Fairview ave., Harvey & Mose, 665 N. ave.

548 Flourney street, Harvey & Mose, 665 North ave.

1630 47th street, J. Monahan, 1636 47th street.

487-89 43d street, J. R. Alcock, 101 22d street.

Greenwood ave. bet. 72d and 73d streets, F. Fischer, 7446 Cottage Grove ave.

Greenwood ave. and 77th street, D. Walsh, 6758 S. Chicago ave.

3623 Grand boulevard, D. & J. Hardin, 217 31st street.

1635 Greenshaw ave., Kretchmer & Kurz, 379 W. Eighteenth street.

Greenwood ave. S. of 45th street, T. & J. Innes, 1806 Wabash ave.

4442 Goodspeed street, Chas. Uher, 524 W. Eighteenth street.

939 Hangan street, Jno. Dewald, 746 South port ave.

57 Howe street, Harvey & Mose, 665 North ave.

224 Humboldt ave., Nelson & Cederholm, 87 W. Ohio street.

1013 Halsted street, R. Coleman, 855 N. Clark street.

Hoyne near Lubeck, C. Breyer, 833 Milwaukee ave.

440-42 Indiana street, Nelson & Cederholm, 87 W. Ohio street.

11 Iowa street, I. J. Geiss, 161 South port ave.

1470 Indiana street, J. Connell, 235 W. Harrison street.

164 Jane street, C. Breyer, 833 Milwaukee ave.

231 Kinzie street, Schuster Bros., 234 N. Clark street.

279 Kedzie ave., Geo. Miller, 1138 W. Lake street.

73 Keenan street, C. Breyer, 833 Milwaukee ave.

Lawndale, N. of Ogden ave., J. Breen, 373 W. Van Buren street.

2931 Lowe ave., L. Herzog, 2230 Archer ave.

639 Leavitt street, I. J. Geiss, 161 South port ave.

5740 LaSalle street, J. W. Sanders, 3427 State street.

Langley ave., and 72d street, D. Walsh, 6758 South Chicago ave.

Langley and 66th street, D. Walsh, 6758 South Chicago ave.

38-40 Lexington ave., M. C. McDonald, 383 Ogden ave.

1168 Lawndale ave., C. F. Klentz, 552 Elston ave.

5018 Morgan street, M. Stack, 723 Root street.

1299 Madison street, P. Morrissey, 417 S. May street.

1301 Madison street, C. Breyer, 833 Milwaukee ave.

Milwaukee and Chicago aves., C. Breyer, 833 Milwaukee ave.

92d and Commercial streets, Webster, Crombie & Henderson, 9243 Commercial ave.

230 92d street, Brunt Bros., 9115 Erie ave.

269 Oakley ave., John Wilkie, 262 Ogden ave.

Oakenwald ave. and 46th street, J. F. Mathews, 3241 Cottage Grove ave.

443 Parmelee street, J. Hois, 609 W. 21st street.

2832 Portland street, J. Teutsch, 2961 Wentworth ave.

3133 Parnell ave., J. R. Alcock, 101 22d street.

1302 Seventeenth street, Steiner & McFarlane, 918 W. 21st street.

68th near Winter street, W. Johnston, 652 65th street.

819 Sixtieth street, W. Johnston, 652 65th street.

69th street and R. I., W. Johnston, 652 65th street.

5900 Sherman street, J. H. Kilian, 333 22d street.

94 Seminary ave., F. Neustadt, 300 North ave.

79th street near Wood, Lyon & Lee, 6215 Wentworth ave.

4119 Sherman street, M. Stack, 723 Root street.

8930 Superior ave., Webster, Crombie & Henderson, 9243 Commercial ave.

67th street near Perry ave., Lyon & Lee, 6215 Wentworth ave.

781 78th street, C. Kostlevy, 218 W. Eighteenth street.

6738 State street, Mandable & Deveny, 2306 Cottage Grove ave.

65th street, Geo. Sherman, 4451 State street.

State and 66th street, Wixted & Gibson, 110 39th street.

489 Superior street, J. Connell, 235 W. Harrison street.

5644 Sherman street, W. Bowden, 238 25th street.

141 Samuel street, C. Breyer, 833 Milwaukee ave.

65th and Winter streets, C. Kostlevy, 218 W. Eighteenth street.

185 Seventeenth steeet, C. Kostlevy, 218 W. Eighteenth street.

1291 Turner avenue, Steiner & McFarlane, 918 W. 21st street.

Fremont near Chicago ave., G. Fehr, 80 Canalport ave.

560 Twentieth street, C. Kostlevy, 218 W. Eighteenth street.

Twelfth street, W. of Sawyer ave. C. Kostlevy, 218 W. Eighteenth street.

367 25th street, Nash & Harna, 2216 Wabash ave.

360 24th street, Wixted & Gibson, 110 39th street.

26th and Bonney streets, G. Miller, 1135 W. Lake street.

50 Vernon park, J. Connell, 255 W. Harrison street.

673 25th street, J. Hois, 609 W. 21st street.

4914 Wabash ave., Watson & Davidson, 301 Wabash ave.

Washington boul. near California ave., L. G. Griffin, 169 W. Madison street.

5032 Winchester, Charles Uher, 524 W. Eighteenth street.

Wrightwood ave. E. of Lincoln, C. Schuster, 266 Wells street.

Wollcot and Leland streets. G. Franklin, Ravenswood.

3639 Wentworth ave., J. R. Alcock, 101 22d street.

1025 Whipple street, C. Kostlevy, 218 W. Eighteenth street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: S. S. Beman has designed the new car shops to be built at St. Louis, Mo., by the Pullman Palace Car Company. The buildings will cover a ground space of 300x400 and will cost $180,000. For the same company he has prepared plans for the enlargement of the repair shops by the erection of another large building; cost, $60,000. For the Street Railway Department of the same company he has planned an additional building; cost, $8,000. He has planned a $5,000 building for the saw mill at the same place. For George M. Pullman he is making plans for a coach house and stable to be built in the rear of the latter's residence at Prairie avenue and Eighteenth street. It will be built of brownstone, with slate roof; cost, $23,000. Lamson & Newman have planned two 3-story flat buildings, 48x65, for Charles Braun, to be built at Wood and Jackson streets; cost, $18,000. C. M. Staiger will build, after plans by the same architects, a 2-story residence, 25x72, on Belden avenue, near Clark street; cost, $9,000. Julius Speyer has planned, for A. Harper, a 4-story store and flat building, 28½x100, to be erected at the northeast corner of Van Buren street and California avenue; cost, $20,000. L. G. Hollberg will build for himself a 3-story and basement flat building, 98x75x48, on School street, near Clark; cost, $18,000. Hetherington & Warner have planned a 3-story and basement flat building, 25x85, for J. J. Ward, to be built on Oak street, near Pine. Bedford stone and hardwood; cost, $10,000. For Mr. Nelson they have designed a 3-story and basement flat building, 22x85, to be built on Wallace street, near Thirtieth. Stone front; cost, $10,000. They have also planned alterations to the extent of $6,000 in J. W. Sheridan's residence at Ashland avenue and Polk street. The same architects have designed alterations in the Church of the Messiah at Michigan avenue and Twenty-third street, consisting of interior decorations, etc.; cost, $5,000. J. E. O. Pridmore is planning a pavilion and concert hall, 73½x161, for Dr. Calwell, to be built on State street, near Sixty-first street. The lower part will be built of stone and brick, and the upper will be frame. The hall will have a seating capacity of 1,500; cost, $35,000. W. G. Borfield has planned a 3-story store and flat building, 125x70, to be built at the corner of Forty-fifth and State streets by John O'Malley. The front will be constructed of stone and the interior will be finished in hardwood; cost, $25,000. W. J. Van Keuren has completed plans for an edifice for the Congregational Society at Mont Clare. Alfred Smith has planned a 3-story flat building, 25x70, for Mrs. Ellen Rand, to be built at 428 Marshfield avenue. Ostling Bros. have designed the reconstruction of a dwelling on Twenty-fourth place, near Wentworth avenue, for J. Peterson, at a cost of $5,000. Park & Fuller have designed for William Ashton & Son, four 2-story dwellings, to be built on Calumet avenue, between Forty-second and Forty-third streets; cost, $32,000. They have also planned a 2-story basement and attic brownstone front flat building, to be built on Jackson street, by R. Thomas. They have also planned a 2-story basement and attic flat building, to be erected at 1564 Monroe street. George Grussing has planned a 2-story flat building for Thomas Jubb, to be built on Fulton, near

Francisco street. He has also planned a 2-story flat building for S. W. Roth, to be built on Homan near Chicago avenue, and for James Barry a 2-story flat building, to be erected on Lake street, near Garfield Park.——New York City, N. Y.: At a meeting of the Retail Grocers' Union, the Building Committee reported that they had concluded their search for a site for a new hall, and had decided upon a property on Fifty-seventh street, between Third and Lexington avenues. The property could be purchased for $34,000. The committee was authorized to negotiate for the property. The plans for the new armory at Thirty-fourth street and Park avenue were approved last Saturday by the Armory Board. The building will cost about $350,000. It will be occupied by the Seventy-first Regiment and the Second Battery. The architect is J. R. Thomas, who made the plans for the Eighth Regiment Armory. Bids for erecting the building will be adertised for. Constable Bros., 216-20 West Twenty-third street, have completed plans for addition to foundry at Greenpoint, L. I., for Messrs. Poulson & Eger.——Philadelphia, Pa.: Four large building operations will soon be under way. The most important, probably, is the plant to be built by the National Publishing Company, Eighth and Cherry streets, upon the site of the old style building recently destroyed by fire. The drawings for the new edifice have been executed by Will H. Decker. The building will be six stories high, with a wide frontage on Cherry street. It will be built of Philadelphia pressed brick, with gray stone trimmings. Contraetors have submitted estimates upon the plans prepared by Architect Heckman for a stone house to be built at Merion for Charles Potts. Besides the mansion there will be a large stone stable and a lodge house on the grounds, which will be surrounded by a stone wall. A 6-story store, 25x230, to be built for the Brown estate at 1332 Chestnut street by Contractor Thomas H. Doan. Professor Sloane, of Princeton, N. J., will build several houses at Hazelwood, Pa., costing $30,000. James T. Steen of Pittsburg is the architect. Hammonton, N. J., is to have a new school house. Edwin F. Bartolette has prepared the plans.——San Francisco, Cal.: T. J. Welsh is preparing plans and specifications for completing the exterior of the Dominican Church, on the west side of Steiner street, between Bush and Pine. The improvements will cost about $35,000. Architect William Curlett is preparing plans and specifications for alterations and additions to Lebanon Church, on Sanchez street, near Twenty-third. The cost of the improvements will be about $5,000. He is also preparing plans and specifications for two fire-proof wings to the City Hall in Fresno, the cost to be $100,000. The Young Men's Christian Association have decided to improve their property on the northeast corner Mason and Ellis streets. The building will be 6-stories in height and stand on a lot 87.6x137.6, leaving about 50 feet unoccupied. A feature of the building will be a gymnasium 50x137.6. Plans are to be prepared at once, with the intention of breaking ground in September, and A. Page Brown has been appointed architect. Herbert B. Maggs has completed plans and specifications for the buildings to be erected by the Stock Yards Company at Baden, San Mateo county, and contracts have been let for the construction of the concrete walls of the lower story of the main buildings. The largest structure is 128x196 feet in size and is to be used for a slaughter-house and cooling rooms. Another building is 48x100 and 4-stories high. There is also a block of buildings covering an area of 112 feet square, embracing a fertilizer 4-stories high, a tank house 3-stories and a boiler house 1-story, There is a structure 64x72 in which are ice machines and engines. The following plans have been completed in the office of Polk & Gamble: A country house at St. Helena, Cal., for Mrs. W. D. Bourn; cost, $40,000. For a town house for Lee Lasp, on the corner of Washington and Baker streets; cost, $8,000.——Detroit, Mich.: Malcombson & Higginbotham have plans for a 2-story brick store on north side of Michigan avenue, near Harrison, for Cronenwett; cost, $6,000. John Scott & Co., have prepared plans for a 1-story office edition of brick on south side Jefferson avenue, near Adair street, for Michigan Store Company; cost, $15,000. A. C. Varney & Company, have prepared plans for a 3-story brick store and flats on Michigan avenue, near First street, for J. W. Dailey; cost, $5,500. Also 3-story brick trunk manufactory, 50x180, for Beals & Selkirk, Wyandotte, Mich.; cost, $15,000. Also 2-story brick residence on north side of Columbia street, between John R. and Brust streets, for Mrs. William Robinson; cost, $5,500. Gordon W. Lloyd has prepared plans for an 8-story pressed brick office building on the northeast corner of Washington avenue and Clifford street, brownstone trimmings, 61x100, for Hugh McMillen; cost, $200,000. Also 3-story brick on Thirteenth street, near Grand River avenue, 65x136, for Women's Hospital and Foundlings' Home; cost, $50,000. Donaldson & Meier have prepared plans for 3-story brick foundry on Macomb street, near Brush street, for M. Hardoin & Co.; cost, $10,000. Peter & Dederichs have prepared plans for 4-story brick factory, south side of Gratiot avenue, near Antietam street, for Alphonse Posselius; cost, $15,000. Rogers & McFarland have prepared plans for 6-story brick, to be occupied by Banner Tobacco Co., situated corner of Congress and Randolph streets, for Bagley estate; cost, $30,000. E. E. Myers is preparing plans for addition to front of building, corner of Clinton and Joseph Campan avenue; for Cooper Memorial Presbyterian Society; cost, $5,000. Hess & Raseman are preparing plans for synagogue, to be of brick with buff stone trimmings, slate roof, situated on Mullett street, near Hastings street, for B'nai Israel; cost, $12,000. Also plans for 3-story brick stores and flats on the southeast corner of Michigan avenue and Nineteenth street, for Frangott Schmidt; cost, $10,000. E. A. Walsh & Son have prepared plans for a 2½-story brick residence on northeast corner of Abbott and Trumbull avenue, for Mrs. M. Myers; cost, $6,000.

HEATING AND LIGHTING.

New electric light plants or extensions of existing systems are reported as probable at Huntsville, Tex., address W. S. Gibbs; Ellicott City, Md., address J. Schrieher, of Baltimore; Graham, Va., address the Graham-Bluefield Electric Co.; Harrimon, Tenn., address the Cumberland Mfg. Co.; Pass Christian, Miss., address C. M. Rhodes; Ellenville, N. Y.; Franklin, Va., address W. W. Moore; Morris, Ill.; Marion, Ind.; Centreville, Ia.; Luling, Tex.; Berwyn, Ill.; Harleysville, Pa.——The following electric light companies have been recently incorporated: Riverside Edison Co., Riverside, Ill.; capital stock, $40,000. Maryville Electric Light & Power Co., Maryville, Mo.; capital stock, $25,000. Washington County Electric Light & Power Co., Cambridge, Shushan and Salem, N. Y.; capital stock, $10,000; incorporators, D. Zeiserand, of Troy; F. C. Lovejoy, of Shushan; J. D. Hall, of Cambridge.——Augusta, Ga.: The Mayor has advertised for bids for street lighting with 250 arc lamps of 2,000 c. p., 125 incandescent lights of 32 c. p., and 75 incandescent lights of 65 c. p. The City Council has instructed its Lamp Committee to inquire into the advisability of erecting a municipal plant. Sealed bids will be received for constructing a plant with a capacity of not less than 300 arc lights, 150 incandescent lights of 32 c. p., and 100 of 65 c. p., the bids to include cost of material, dynamos, labor, etc., and the plant to be in operation by July 1, 1892.——Villisca., Ia.: The city has voted to install a municipal plant.——Worthington, Ia.: The city has voted to issue bonds for water works, and an electric light station.——Marion, Ind.: The City Council has voted to purchase an arc light plant of 100 lamps capacity, and to operate the same in connection with the water-works. The plant will cost in the neighborhood of $22,000, and probably run with Wood machinery.

SEWERAGE NOTES.

Medford, Mass.: The town will probably put in sewers.——Leominster, Mass.: An appropriation of $2,500 for sewers has been voted.——East Hampton, M2ss.: Plans for a sewerage system are being made.——Toledo, Ohio: A syndicate proposes to raise $250,000 for sewage.——Oakland, Cal.: Land has been purchased for a pumping station for the main creek sewer.——Mayfield, Cal.: It is proposed to build a sewerage system.——Kansas City, Mo.: The extension of the O. K. Creek sewer to Turkey creek is urged, and the city will be able to raise about $246,000 for this purpose. Ogden, Utah: The city council has approved the estimate of over $30,000 for new sewers on 25th and 26th streets. Colorado Springs, Col.: The city engineer is making estimates on the cost of extending the sewerage system.——Meadville, Pa.: Extensive sewer works are contemplated.

WATER WORKS NOTES.

Ashland, N. H.: Surveys for works have been made by John Keniston, Plymouth, for the town. Proposed supply, Jackson Pond, 113 to 308 ft. above the town and 2 1-5 miles from Main street. Five miles of pipe and 40 hydrants will be needed if the works are built.——Barre, Mass.: Works are talked of.——Lowell, Mass.: It is reported that 6 experimental wells will be sunk.——Newport, Me.: There is talk of works, with a supply from a pond or by pumping from Lake Sebasticook.——Alfred, N. Y.: Works are projected, Address P. A. Burdick.——Broc-

ton, N. Y.: There is talk of building works.——Rome, N. Y.: A 20 in. main 1,000 ft., and a 16 in. 700 ft. long are proposed.——Walden, N. Y.: Fire protection works are projected. E. A. Nichols is village clerk.——Walton, N. Y.: The Walton Water Supply Co. has been incorporated by E. R. Howland, A. E. Ogden and others; capital stock $15,000.——Hyndman, Pa.: It is reported that the Hyndman Water Co. has been incorporated by J. K. White, W. J. Carpenter and others.——McDonald, Pa.: It is reported that works will be built.——Barnesville, Ga.: Works have been talked of for some time, and now propose to put them through with private ownership if the town will not build. Supply, springs and steam, pumping to reservoir or tank. Population, 2,500.——Hawkinsville, Ga.: Authority to issue $15,000 of bonds for works has been asked. The town has a well.——Port Gibson, Miss.: It is proposed to organize the Port Gibson Water Works Co., composed of local capitalists, and to build works estimated to cost $20,000. Supply, Bayou Pierre, pumping direct. Population, 2,000.——Connelton, Ind.: Franchise for work was granted, but has been forfeited by failure to begin construction. Population, 2,800. This town and another, about three miles below, with population of 2,500, could be supplied by one system, and correspondence is desired with parties who wish to secure franchises.——Ashtabula, O.: The Ashtabula Suburban Water & Light Co. of Chicago has been incorporated under the laws of West Virginia; capital stock $50,000.——Cleveland, O.: It is reported that plans are being made to extend the intake tunnel further into the lake.——West Indianapolis, Ind.: The Indianapolis Water Co., it is reported, will extend its works to supply this town, laying about 9,000 ft. of 12 and 6-in. pipe.——Marshfield, Wis.: The Council has granted a franchise for works to Moffett, Hodgkins & Clarke, Syracuse, N. Y. There will be 7½ miles of mains and 68 hydrants, the latter at an annual rental of $4,000. The works are to be completed by Mar. 1, 1892.——Tuscola, Ill.: An election to vote on bonding the town for $10,000 for works will be held Aug. 29.——Effingham, Ill.: The Council has appointed a committee of five of its members to receive bids for a franchise.——Jackson, Mich.; W. R. Coats has reported in favor of a 30x30 ft. reservoir or pump well and an elevated steel tank 75 ft. in diameter by 32 ft. high on a masonry tower 60 ft. high; also about ¾ mile of 16-in. pipe to connect the present tubular well with the new pump well. Estimated cost, $73,350.——Duluth, Minn.: The people have voted in favor of the issuance of $800,000 of water bonds. The plan is to supply, at present, those parts of the city not supplied by the company, and eventually to supply the whole city. It is proposed to erect a pumping station on the north shore of Lake Superior, near the mouth of Lester river, and force water to a high service reservoir. City engineer, E. H. Keating, has made a preliminary estimate of the cost of establishing pumping works, low and middle service reservoirs, and middle and high service pumping stations and the necessary force mains. The estimated cost is $1,000,000, not including the distributing system.——Tacoma, Wash.: The North End Water Co. has been incorporated by R. B. Mullen, Anna Mullen and F. M. Harsberger to develop the "Mullen Water Works" in a section where the Light & Water Co's. mains do not extend; capital stock, $40,000.

BIDS AND CONTRACTS.

Beatrice, Neb.: Bids will be received by the Council until September 8 for material and labor in connection with waterworks improvements, including a 2,000,000 gallon well supply, 6,400 ft. 12-inch cast iron pipe, specials, 12,000 lbs. lead, a 1,500,000 gallon compound condensing engine and 7½ x 16 ft. boiler; also moving and resetting engine and boiler. Address O. V. P. Stout, city engineer.——Gainesville, Fla.: Bids are wanted until September 1 for the construction of a complete system of waterworks. Address A. J. McArthur, chairman of the water supply committee.——Council Bluffs, Ia.: Bids will be received by the Board of Directors of Independent School District at the office of George Brown, Secretary, until August 31, for the repairing and improving of the steam heating system in the Bloomer school building and the High school building.——Cleveland, Ohio: Proposals will be received at the office of the Board of Control, No. 5 City Hall, until August 26, for the construction of sewers in various avenues. — Sabetha, Kan.: Proposals are wanted until August 26, for the erection of a brick school building. Address J. Y. Benfer, Seneca, Kans.——Sandwich, Ont.: Proposals are wanted until August 26, at noon, for furnishing necessary materials and constructing water mains in Sandwich, Ont. Address James A. Stewart, Town Clerk.——Dartmouth, N. S.: Proposals are wanted until September 1, for the construction of a system of waterworks. Address Mayor Frederick Scarfe, as above.——Stephenville, Tex.: H. H. Hardin, County Judge of Erath County, will receive bids until August 31, for the erection of a new court house.

HARVEST EXCURSIONS VIA THE WABASH.

The Wabash Railroad will run a series of Harvest Excursions to the West and Southwest at extremely low rates, leaving Chicago August 25, and September 15 and 29. For full particulars address F. A. Palmer, A. G. M. A., 201 Clark Street, Chicago.

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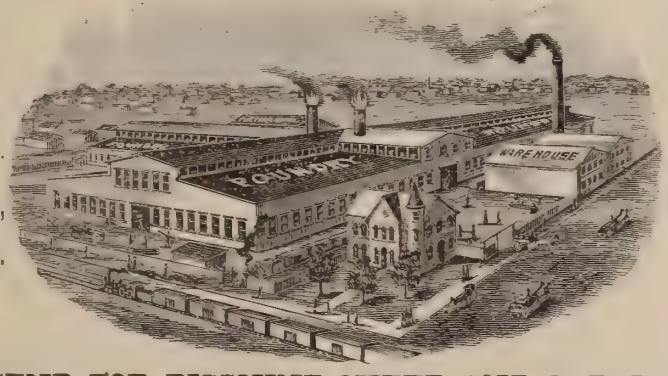

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Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

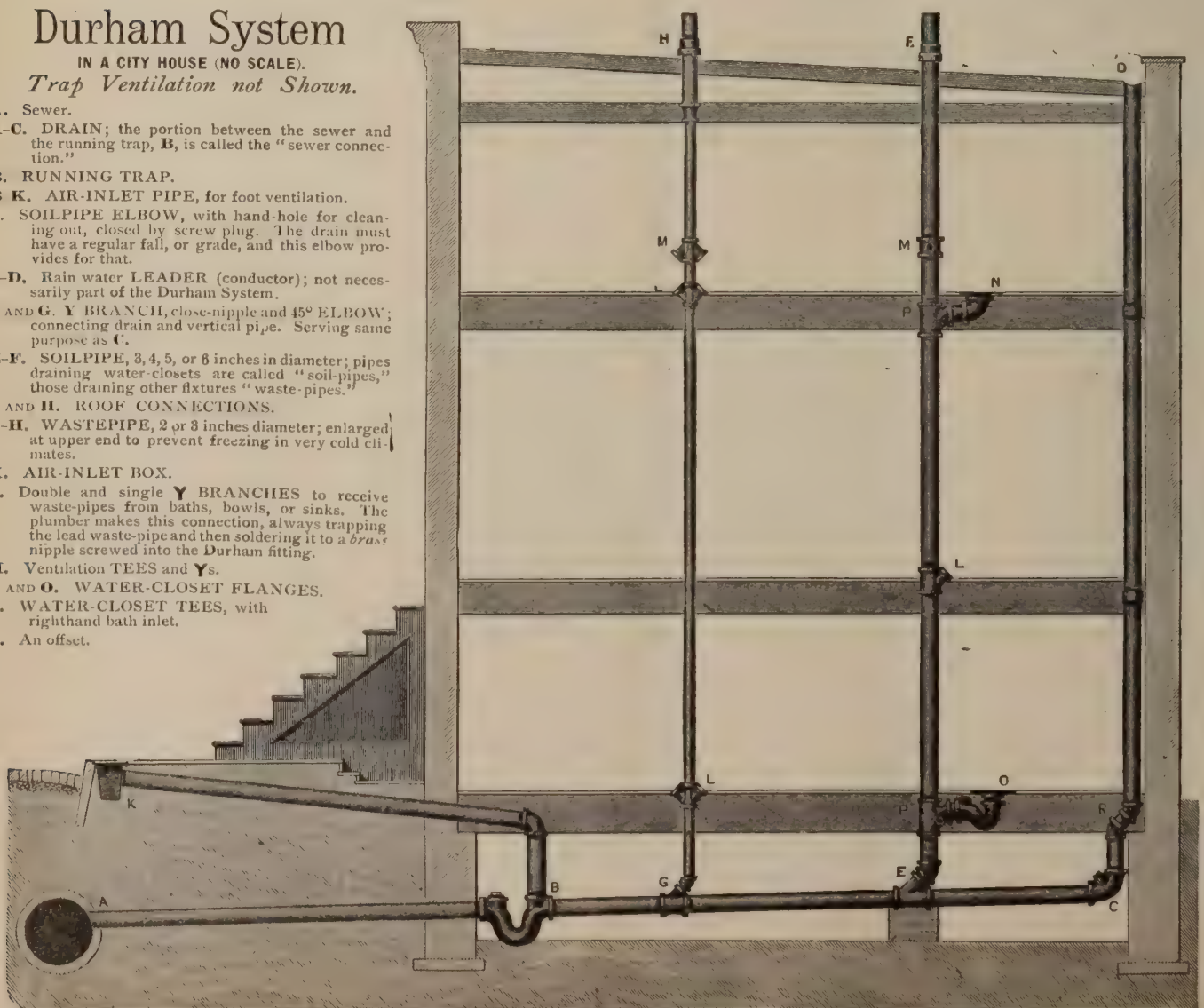
L. Double and single Y BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and Ys.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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LONDON OFFICE.

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A few complete sets of The Sanitary News, from the first issue, are stil left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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We begin this week the publication of a series of articles on traps. They were to appear sooner but circumstances would not permit the space necessary for them. The articles are each written by the manufacturer or inventer of the trap described and we are not responsible for the opinion expressed. The discussion of "combination" traps and back venting, which was published in The Sanitary News a short time since, led to the idea of having the manufacturers or inventers of these traps to write an article descriptive of their traps from their stand point, as a better description could come from them than anyone else. All were invited to furnish such an article but all have not taken advantage of the opportunity offered. Those who have will find their articles published as they were written with no comment. Our readers can comment on them for themselves. These traps are on the market and are being used, and a good description of their merits will be of interest to the plumbing trade. The article will be illustrated and made readable and interesting. The whole subject is an important one, and is receiving more consideration daily. The subject is still open for discussion.

When you are in doubt about the condition of your plumbing take the benefit of the doubt and have a reputable plumber inspect it without delay.

It should be remembered that no one but a reputable, well qualified plumber can do plumbing work safely. The tinsmith or jerry plumber is the most dangerous person to employ about the home. He may offer inducements in the way of low prices, but the result will be a higher rate of sickness.

When health boards recognize the importance of good plumbing as a sanitary measure, it surely is time for the people to give, serious consideration to the procurement of proper plumbing.

Cleanliness is the first step to health. This means not only of person but of premises.

We must have air and water in order to live. These must be pure in order to be healthful, yet these elements are about the most easily polluted of all the essentials of life, and we might say about the least attention is given them.

Sanitary measures have diminished more than thirty per cent. the death-rate from consumption in England since 1861.

It will be seen elsewhere in this issue that the St. Louis Master Plumbers' Association is at the front. The members of that association have a national ruputation, and they can show as good plumbing as can be found in the United States. In association matters they are in the front rank and due to them are to a great extent the progress and prosperity of the National Association. Their hospitality is proverbial and knows no bounds. Their annual picnics have attracted attention from all quarters of the country, and they are truly highly enjoyable. We will long remember the kindness and whole-souled hospitality of the St. Louis plumbers.

Good plumbing is the most important sanitary feature about the house, and should never be neglected.

It is not difficult to procure good plumbing. Get a regular qualified plumber to do the work and the difficult problem is solved.

AS OTHERS SEE US.

The articles which have been appearing in The Sanitary News weekly on the subject of "The Smoke Nuisance," have attracted wide attention from all sections of the country. Letters of inquiry continually reach us, and information regarding many subjects is asked for. We have said somethings regarding the abatement of the nuisance in this city, and have been as mild and charitable as the circumstances would permit. The fact is plainly to be seen that we have too much smoke; everyone will say that. That this smoke can be prevented there is no doubt, and the question should not be dropped till the smoke disappears. It may be interesting to our officials to know that the present state of affairs is known outside of our city and that our smoke is

seen in New York It is not right that Chicago should bear the reputation she has received in other cities when the means of preventing smoke are so near at hand. If the blame would fall where it belongs it might matter less, but the fact that it is the city which receives the bad name is deplorable, and every citizen should use his influence to have the evil removed that Chicago's reputation might be as good as she deserves. The *Sanitary Plumber* of New York takes the following view of the matter:

The pall of smoke that hangs over so many of the cities of the West, especially noted in the great industrial centers of Ohio, Pennsylvania and Illinois, is an evidence of careless disregard for health and economy, a slovenly way of doing things generally, that invariably makes an unfavorable impression on a stranger. Chicago, with all her magnificence, is remembered as much on account of her grimy atmosphere as for anything else, and the Americans who have the hardihood to poke fun at London's smoke and frogs, know but little of the great cities of the interior that lie on and near the soft coal belt.

During his term of office as chief inspector of the Chicago Health Department, Andrew Young was able to effect an appreciable improvement in the great city by the lakes as far as the smoke nuisance was concerned. Of course, it involved an expenditure of time and of energy that no mere politician would be likely to bring to bear on the accomplishment of an "official" object, and it led to some unpleasant contests with business men and others whom the politician would sooner placate (if he could not bleed them) than antagonize. But it had one good effect; it proved beyond a doubt that the nuisance could be abated, and that if the people of Chicago liked to bestir themselves and demand an energetic, impartial health officer, they could, to a certain extent, ameliorate the smoke nuisance.

But it is not only the private consumers of soft coal who are to blame in the matter. One of our western contemporaries flies at much higher game; he accuses some of the city officials of being themselves among the most flagrant violators of the smoke-nuisance act.

"Within the last year," says the journal in question, "we have repeatedly called attention to the volumes of black smoke that belch forth from the chimneys of some well-known buildings, among which are the Cook County Hospital buildings on Harrison street. Mr. Young, the smoke inspector, when in office, gave attention to the smoke nuisance in this quarter, but it is now worse than ever. If officials will not stop the smoke nuisance on city buildings and city property, can they expect manufacturers and hotel proprietors, and steamboat owners to obey the law. Hospital buildings that will accommodate 500 patients, and which in architecture and equipment are among the finest public buildings in Chicago, should be, for many reasons, entirely free from nuisances. But they are not. The smoke is black, thick and constant. The back of the hospital grounds reek with filth and stench. Such a state of affairs is a burning shame and disgrace. There is work for health commissioners right here, and we cannot suppose they are ignorant of these nuisances or powerless in effecting their removal."

The laws at present extant in Cook County, Illinois, properly enforced, can be used to effectually reduce the torrent of black smoke that makes Chicago so unpleasant a stopping place; it rests with the people to demand, in unmistakable terms, their impartial execution. It should be a matter of personal pride with every resident in Chicago especially, to secure the greatest possible abatement of this nuisance before the World's Fair takes place in 1893, and meanwhile other western cities between Buffalo and St. Louis might well give the subject the benefit of their thoughtful consideration.

NOTES AND NEWS.

The patent for the manufacture of artificial stone expired July 14, 1891.

It has been reckoned that if the whole ocean should be dried up, all water passing away in vapor, the amount of salt remaining would be enough to cover 5,000,000 square miles, with a layer, one mile thick.

A new motor utilizing ordinary gas as well as petroleum, is announced, compact in form, requiring little space and no expensive foundations or attendance. In one-half minute's time starting can be accomplished.

Red stockings are generally colored from matters of aniline, which contain large quantities of antimoniac products. When perspiring, this matter becomes soluble, enters the pores of the skin, and produces a violent rash.

The danger of conveying infection by lancet or needle having been pointed out, a French surgeon proposes vaccinating with ordinary steel pens, especially pointed. Being inexpensive, a fresh pen can be used for each operation.

A handful of crude pig iron, weighing about five pounds, is worth five cents. It would make about sixty table knife blades worth $15,000; converted into steel watch springs, there would be about 110,200 of these little coils, which at the rate of $1.75 a dozen would be valued at $16,070.83.

Steam pipes have been made in England from the ramie fiber. This material is subjected to tremendous hydraulic pressure, and, having the property of being unaffected with moisture, will neither shrink nor swell, besides being a non-conductor of heat. The pipes are said to have a tensil strength twice that of steel pipes.

It appears that in Scotland there is a company which pays a certain amount yearly to a number of iron works for the privilege of collecting the smoke and gases from the blast furnaces. These are passed through several miles of wrought iron tubing and as the gases cool there is deposited a considerable yield of oil; one plant is reported to yield 25,000 gallons of furnace oil per week.

The *Engineering Record* describes an apparatus invented by M. Emil Sokal for the purpose of clearing away the sludge in the sewers of Warsaw when flushing is inapplicable. The device consists of a wooden template or mould, fitted to the profile of the sewer, and resting on a batten 1½ in. thick, pointed at the end for the purpose of penetrating and loosening the sludge. The flushing sluice above the portion of the sewer to be cleaned is closed, and water allowed to accumulate. About 6 ft. or 10 ft. lower down the template with the pointed scraper is set up; the sluice is now opened, and the scraper, which is under the control of a workman, moves on and clears the deposit. If this be very solid and hard, a small shutter in the template is opened, and water, sufficient to thin it, is admitted, or the scraper may be taken over the same ground as often as necessary.

ST. LOUIS PLUMBERS' ANNUAL PICNIC.

In compliance with the orders of Mr. Reardon, left at this office, and the hearty invitation extended by the Committee of the St. Louis Master Plumbers' Association to attend their annual meeting and outing, the writer wended his way to St. Louis and arrived there on Thursday morning. A shadow fell between him and the sun in the person of the renowned David Collins who had taken us in tow, marched us on board the Great Republic, the largest steamer on the Mississippi. Every moment brought fresh accessions until the steamer was filled with a happy, joyous crowd of men, women and children whose faces bespoke their anticipation of the pleasures in store for them during the day. Casting loose from the warf the steamer headed towards Alton, our point of destination being the beautiful grove called Willson's Grove, about twenty-five miles from the city. Here an elaborate programme of races, etc., was carried out. The skies that had been gloomy and threatening during our start gave way to the sunshine and the day turned out a most beautiful one. On the trip to the Grove dancing was indulged in on the boat and other amusements, not to speak of a small game participated in by a few of the male sex in the engineer's room of the boat.

Almost every plumbing shop in the city of St. Louis was closed for the day, scarcely a member of the association but was present. Dinner was served to a select party on the boat, the menu consisting of broiled chicken, frogs' legs, cold meats, wine, &c. After satisfying the inner man Mr. Collins, as master of ceremonies, called on our representative for a few remarks. Mr. Gallagher, president of the association, made a few stirring remarks, and Mr. Andrew Young was called for, while Chief Inspector of Plumbing T. J. Hennessey, being loudly called for, made a most stirring address.

Mr. Young on rising stated that he was too full for utterance

owing to the efforts of Messrs. Jones and Hennessey in piling his plate with the choicest of eatables. However he could say that he was more than glad to again meet with the plumbers of St. Louis; in fact, he could say with truth that he never had met with them but what it was a pleasure. He commented on the fact that the plumbers of the United States through the efforts of the National and Local Associations were no longer strangers to one another. The ties of friendship formed by associations had been welded into the bonds of brotherhood, and to-day the plumber could travel from one end of the country to the other meeting friends everywhere. It was a most happy consummation and spoke well for our organization that such a feeling existed. Thanking the association for its kindness in extending an invitation to be present and wishing themGod speed in all their undertakings, Mr. Young gave away to Mr. Gallagher.

Mr. Gallagher commented on the fact that ten years ago plumbers doing business on the same street were strangers to one another, would even cross the street to avoid meeting one another. Now all this was changed; instead of strangers they met as friends, and when adversity overtook one of them the hand of brotherhood was stretched forth to aid and assist. This has been brought about through the agency of the local and National Associations. He hoped the association would take no step backward, but would keep on in the good work in the future as in the past.

Mr. Hennessey, Chief Inspector of Plumbing in St. Louis, being called upon stated that he had, perhaps, the easiest job a plumbing inspector ever had, inasmuch as he found the St. Louis master plumbers ready and willing at all times and under all circumstances to aid and encourage his efforts in the advancement to a better sanitary condition of old and new buildings, and in not one instance, he stated, had he been compelled to report a plumber for deriliction of duty. In fact, since his term of office commenced, they had aided and encouraged him in every effort for the better sanitary condition of the City of St. Louis. He paid a high compliment to the association and its members and hoped they might long exist and continue in the good work of improving the sanitary condition of the City of St. Louis. Mr. Hennessey's popularity among the plumbers was shown by the hearty applause given his remarks.

After a few words from the Hon. David Collins the party adjourned to the woods to participate in the games on the programme as follows:

1st Event.—Tug of War, between Masters and Journeymen. Prize, box of cigars.

2d Event.—Fat Men's Race, to members of the trade. First prize, hat. Second prize, cane.

3d Event.—Ladies' Race, 100 yards, free for all. First prize, silk parasol. Second prize, fan.

4th Event.—Hop, Step and Jump, free to all at the trade. First prize, $5. Second prize, $3.

5th Event.—Sack Race, for Boys at the trade. First prize, tool bag. Second, Stilson wrench.

6th Event.—Egg Race for Ladies, free for all. First prize, parasol. Second prize, fan.

7th Event—Potato Race, for Boys at the trade. First prize, set of benders. Second, pair pliars.

8th Event.—100 Yard Race for Master Plumbers. First prize, pair sleeve buttons. Second prize, box of cigars.

9th Event.—Laborers' Contest, Ditch 6x2x2 feet. First prize, $5. Second, $3. Third, $2.

10th Event.—100 Yard Race, for Boys at the trade. First prize, tool bag. Second, caulking irons.

11th Event.—Three-Legged Race, free to all at the trade. First prize, $3. Second, $2.

This programme was rendered most enjoyable by the enthusiasm it was engaged in. The "tug of war" resulted in a draw, because neither side was strong enough to pull up a tree. The master plumbers seeking to win secretly tied their end of the rope to a tree. The journeymen, ignorant of the advantage taken by the masters, had also made secure their end to a tree of about the same size. The crowd about them concealed the stratagem of both sides, and the tug began each side feeling confident of victory. Of all the tugs this was the tuggest, and the complacency of the innocent trees was sublime.

In the "hop, step and jump," Mr. Hennessey leaped like a deer and won easily. He is a winner from the word go, and we hope he will clear every obstacle in his future path with as much ease.

We will back Mr. Jeremiah Sheehan in anything. His speed in the 100 yard race was not quite like the flight of a swift-winged bird, but he got there all the same, and if Mr. Sheehan ever wants backing in the great race of life, all he needs to do is to call on us. He is one of the men whose integrity and virtues go to maintain our faith in the honesty of mankind.

The ladies' race was a tussle with hurrying feet and long grass, the grass often gaining the victory—but then it made a soft bed to fall on, and we do not think the St. Louis female foot deserves the ridicule it has received for its alleged extended dimensions.

Your correspondent visited the Rumsey Manufacturing Company, and was most cordially received. The above firm as usual is doing an immense business, their shipments throughout the West being probably more extensive than any other firm in the Western country.

He also had the pleasure of calling on the Western Brass Company; they are filling their orders as rapidly as possible, having been compelled by stress of business to enlarge their works, which they are now busily engaged in doing. They deserve success.

Our old friend, N. O. Nelson, was seated in his chair dispatching business in his usual happy manner. At his store we met our old friend, the stalwart W. H. Graham, who, as usual, is putting in the plumbing in the finest buildings now being erected in St. Louis. Friend Tumalty has also some very large work on hand. In fact, all St. Louis plumbers are doing well and making money. Their association is still the banner association of the West. Not a firm doing business in St. Louis but belongs to the association.

We called at the well-known place of business of our old friend, Peter White, but regret that we did not have the pleasure of finding him. He was away on business, and we took a survey of his busy manufactory. It is a pleasure to look upon work of this kind—the vast products of his machines, the system, order, industry and care with which the trade is supplied—and feel that honesty is the bulwark on which the great business has been builded. This is true of all our friends in St. Louis, and we are glad that we, from a personal knowledge, are able thus publically to say so.

We met our friend Sheehan, Vice-president of the National Association. We were sorry to be informed of the loss of one of his family a short time ago by diphtheria. We were informed that the son of Thomas Cantwell, a prominent plumber, had met with a severe accident a week or so ago.

Your correspondent spent a most enjoyable time, meeting with kindness on every hand, and certainly hopes that he may be able to attend their next picnic. He cannot soon forget Mr. Jones of the N. O. Nelson Company, who sat on his left hand, or Mr. Hennessey who sat on his right hand, who kept piling his plate with frogs' legs, chicken and other eatables too numerous to mention. And for once in his life he realized the fact that Chicago money is not good in St. Louis.

SANITARY PLUMBING.

To those who are familiar with the possibilities of the plumber's work and the disastrous effects of its shortcomings, says the *Sanitary Plumber*, there is something positively grotesque in the carelessness with which the vitally important question of licensing master plumbers is treated in great cities. It is in the crowded dwelling places of the largest towns, in the mansion of the wealthy, the grand hotel and the poverty stricken tenement alike, that the diseases born of defective drainage are most prevalent. It is only natural that it should be so, for as the number of dwellings increases the sewerage and drainage systems become more and more complicated, and the risk of imperfection increases. And yet it is just in these cities that the laws relating to plumbing are usually more lax than elsewhere. The cause is to be sought principally in politics.

Take New York as an instance, the Empire City and the wealthiest as well as the busiest and most populous of the

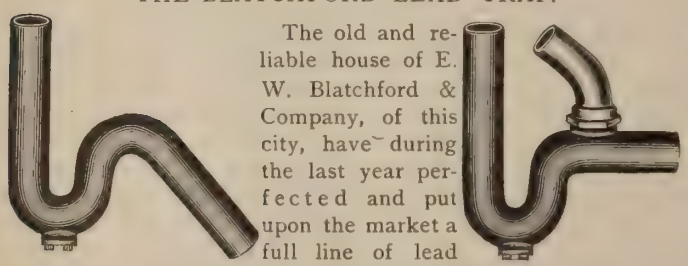
communities of the New World. What restrictions are imposed on the jerry plumber in that town? We have already seen that he has no difficulty in getting a license in spite of the adverse recommendation of the practical men who are supposed to guard the portals to the trade, as long as he has the "pull" with the powers beyond them; although in some instances, notably in a particularly flagrant case to which we have recently referred, we are informed that the "political" plumber was stripped of his stolen plumes in spite of his pull. It is very rarely that a high official will take such a step and risk giving offence to a clique of politicians or alienating a handful of votes. The "snide" plumber gets his license by hook or by crook and keeps it, and as long as he confines his operations, as he usually does, in overhauling jobs in the poorest of property, and avoids new work, he runs little risk of getting into trouble with the inspectors. Some of the rascally work done by these botchers should entitle them to the state's prison at least, but they pursue the evil tenor of their way serenely, and just where their nefarious malpractice is most unlikely to be effected in the dissemination of disease.

This is New York!

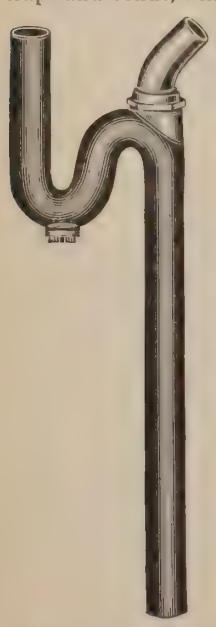
Other cities are slightly better, equally as bad, or a great deal worse, according to the power of the botch plumber to marshal political influence against any attempt to make him an impossibility. It is only a few—a very few—cities in which on old and new work the plumber is held in rigorous account for his doings by inspectors who are competent practical judges of what sanitary plumbing really is.

And yet the signs stares us everywhere in the face. The veriest tyro hanging out his shingle inscribes "sanitary" thereon, and connives at the deception of the citizen at large. The word should surely have some significance, and its use ought to be interdicted to all but those who have proved themselves conversant with sanitary principles and capable of doing a sanitary job. A man may not write M. D. or M. C. P. after his name without due authority at law for the use of the title; why should a tinker who can wipe a joint and stop an easy leak be allowed to advertise himself capable of doing "sanitary" plumbing?

THE BLATCHFORD LEAD TRAP.



The old and reliable house of E. W. Blatchford & Company, of this city, have during the last year perfected and put upon the market a full line of lead traps and bends, which on account of the reputation of this house for thoroughness and enterprise deserve special attention. These traps combine all the valuable mechanical and sanitary features of the best designs while retaining perfect simplicity of construction.

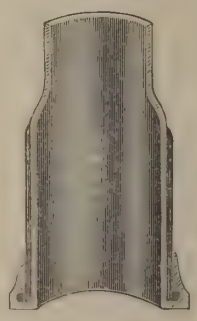


In their design, care has been taken to adopt the shapes most desirable for perfect discharge, and to combine lightness and strength in proper proportions. Recognizing the demand for perfect ventilation, the vents, where used, are placed in direct line above the discharge, thus insuring against the possibility of its obstruction and giving full egress to gases. These vents are fitted with regulation size couplings, and extra length has been provided for wiping joints on discharge pipe of trap.

Having a large experience in the use of different kinds of lead, this company is able to select the purest and most ductile brands, and as these traps are made under their own United States patents by a process which secures a perfectly smooth internal surface, and retains all the valuable properties of the metal, they have obtained a degree of stiffness and ductility unequalled by any other traps now in use; they are highly finished, free from seems or roughness, and graceful in form; they have already received the approval of the best plumbers and dealers in the city.

This company have also introduced a heavy 4-inch S Lead Trap, designed for "Short Hopper" closets, which meets a want long felt by plumbers in this city.

The Blatchford Improved Combination Lead and Iron Coupling Ferrules are made of compressed lead firmly secured to the iron thimble, and having the full inside diameter specified, the internal surface is continuous and finely polished, affording no possible chance for deposit of sediment or escape of water or gases, a fact proved by ample tests. They are readily set in place, neat and attractive in appearance, and altogether a high grade article for a reasonable cost, that will commend itself to the practical plumber and dealer alike.



VENTILATION AND HEATING OF HALLS OF AUDIENCE.

(Continued from page 176.)

Great variety exists in the matter of heaters, but as generally employed they consist of ordinary steam-pipe made up into sections or groups. When connected directly to the fan and made a part of the apparatus, these coils are usually made up on cast-iron bases into which vertical pipes are screwed, connection between the pipes being made by cross-pipes above. These can be readily made up into groups of any desired size, each controlled by a single valve.

The high velocity and the large volume of air drawn across the pipes so increases the condensation of steam and the consequent heating of the air, that one foot of pipe in a heater employed in this manner is usually as efficient as three feet of pipe arranged in the ordinary manner in direct radiators, an item certainly of considerable importance, when it is considered that the direct radiators usually require much higher finish than the coils in connection with the heater.

The most commonly employed motor for driving the fan is the steam engine. As steam must be maintained for supplying the coils, it requires no extra arrangements to supply the engine, and as the exhaust of the engine—being almost as efficient for heating as live steam—is always utilized in the heater, there is practically no additional expense for steam power.

Although the fan is often built with the engine directly connected to it, yet an independent engine driving the fan by belt is more desirable in buildings of the class under consideration.

The rapid introduction of the electric motor renders accessible a motive power that can be used in warm weather when a fire in the boiler, merely for running the fan, would be objectionable.

Doubtless the simplest manner of applying the plenum system is to discharge the air directly into the sub-basement. For this purpose a fan without housing is employed, the air being drawn through the heating coils located in a chamber separate from the sub-basement in which the fan is located, but connected with it through the fan inlet. The air is freely discharged from the periphery of the fan into the large space provided for it, and therein produces a slight pressure, seldom over one-eighth of an inch of water. For satisfactory results the sub-basement floor must of

necessity be cemented, and leakage in all directions must be prevented to as great an extent as possible. The air discharged into this plenum space is conducted to the various rooms above through flues opening into the plenum space and communicating with the rooms.

Notwithstanding the simplicity of this arrangement, the system is more generally applied by using a cased or housed fan communicating with the bases of the various flues by means of galvanized iron or brick ducts. Under either arrangement the heating, cleansing and moistening details may be practically the same.

The principle of distribution of air in rooms of moderate size, having both warm inner walls and outside exposed walls, is to discharge the air from a register in the inner wall at some 8 or 9 feet above the floor. The warm air then passes above the breathing line to the cold outer wall, which is usually well supplied with windows, becomes there slightly cooled, falls to the floor and in a mass passes back to the inner wall where it escapes through a vent register as nearly as possible beneath the inlet register. Disagreeable air currents are thus prevented from striking the person, and the motion of the air made systematic. Contrary to ordinary supposition, by this method of introduction there is very slight difference between the temperature at ceiling and floor.

In halls exposed and provided with windows on three or four sides, resort is frequently had to pedestal registers, which are placed at intervals around the outer walls and discharge the air horizontally along them at floor level. Overhead vent or special wall vent is then possible, but it is difficult to thoroughly distribute the air admitted.

The most thorough distribution of the air is generally accomplished in theaters where no walls are exposed, the entire auditorium being surrounded by the stage and corridors. Although side-wall heating and ventilation are possible in such a room, yet the best results are secured by thoroughly dividing the air supply and admitting it in very small portions through the seat risers, either by registers in their fronts or by perforated beading of sheet-iron at the junction of the riser and tread. Extreme care is, however, necessary in such an application to avoid too high velocity through the openings at any point.

The true principle of ventilating large audiences by an upward movement of the air is here applied, escape for foul air being provided through large registers or ornamental ventilators in the ceilings. These are peculiarly efficient when gas is used as an illuminant, as from their centers the large chandeliers are usually suspended. Special hoodings around the gaslights in the boxes allows of the escape of vitiated air into properly arranged vertical flues.

In churches, floor registers are feasible if the velocity of air through them is low enough, or the system of wall distribution and vent can be readily applied with either special inlet or vent around the alter. In the modern style of Sunday-school room with two stories and a series of class rooms upon each floor, partially surrounding and opening into the main room, individual wall inlets and floor vents are desirable in the separate rooms.

With the plenum system of forced circulation, it is always advisable to place direct steam coils or radiators in such rooms as lavatories, bath-rooms and those containing water-closets, and to provide each room of this description with an extra large vent register and flue. The result will then be that when the fan is in operation there will be a constant current passing into the room and not through the vent register. This will absolutely prevent any perceptible odor or impure air escaping to adjoining rooms.

The same holds true with regard to kitchens, which should be amply provided with vent flues, the registers being most serviceable if placed at the ceiling. In school buildings containing chemical laboratories, a proper arrangement of hoods, and the conduction of all objectionable experiments beneath them, will avoid inconvenience in adjoining rooms. In this case the laboratories are supplied with an excessive quantity of air per occupant, and the ventilation so arranged as to compel the greater part of the air to escape through the hoods, which should be arranged to close to within only 1½ or 2 inches of the bottom so as to always allow for the entrance of air from the room at the maximum velocity; of course the top of the hood must be connected to a vent flue.

The criticism is sometimes made that with the fan or blower system the air enters the room through the registers at too high a velocity. It must, however, be evident to anyone who will give it a moment's thought, that the area of the register and the volume of air admitted are the two factors that determine the velocity, and that on a given basis of area and volume the velocity is entirely independent of the system employed. The fact is, however, that with the fan system the air can be discharged into the room at higher velocity than with any other system. In fact, in manufacturing establishments, a high velocity is usually desirable in order to force the air long distances. In a certain case, for instance, under the writer's observation, there is a room 50 feet wide by 165 feet long, heated entirely from a 20-inch pipe just projecting through the wall at one end and discharging along the ceiling the entire length of the room. As a rule, the part farthest removed from the air supply is the warmest. The air usually leaves the inlet pipe at a velocity of about 2,000 feet per minute and a temperature of 120 degrees.

Such a velocity would naturally be entirely inadmissible in the ordinary school-room measuring only about 28x30 feet. Here the velocity through the register should be reduced to about 500 feet per minute, which, on a basis of net area of register equal two-thirds of gross area, would require a 24-inch by 30-inch register for an air supply of 30 cubic feet per minute for the usual 50 pupils. The vertical flue velocity may be maintained at anywhere from 600 to 1,000 feet per minute, but had better not exceed 800 feet if possible. However, in some cases, particularly in old buildings, flues are necessarily restricted in area, and high velocities cannot be avoided; as a rule, smaller flues can be used with the fan than with other systems, owing to the positive impulse given to the air.

In the basement the tin or sheet-iron ducts connecting the fan with the bases of the flues can be still further restricted in size, and, although objectionable, velocities as high as 2,000 feet per minute may be maintained.

In order that the temperature of any individual room may be varied without changing the volume of air admitted, various arrangements are introduced.

Direct radiators may be placed in the rooms and regulated at will by the occupants, the fan supplying air independently at a temperature only high enough to maintain at a comfortable temperature the rooms most easily heated. The necessity of additional heat due to especial exposure is then met by the use of the direct heating system. Such an arrangement necessitates a complete job of steam piping extending throughout the building with its possibilities—and probabilities—of leakage, hammering and freezing, and with but little saving in amount of heating surface because of the use of the fan system.

The presence of any steam piping and radiators above the basement floor may be avoided by using individual indirect coils at the bases of the various flues, the air being admitted to these coils at a temperature of about 60 degrees, and there further heated by the coils to any desired degree. These coils may be placed under the control of the engineer, who can easily manipulate the valves in the basement, or with complicated arrangements may be controlled by the occupants of the various rooms.

The former arrangement of super-heating coils in connection with a plenum fan system, discharging air at 60 degrees into an air-tight sub-basement, was adopted some years since in a building erected by the Massachusetts Institute of Technology at Boston. Here doors and peek-holes were placed in all the flues at about 5 feet above the basement floor, so that the janitor could readily determine the quantity and temperature of the air delivered to the different rooms. It was his duty to make regular visits to all the rooms, and by manipulation of the supplementary coils to maintain the temperature at the desired degree.

This duty of the janitor is avoided in Lever Hall, Harvard College, as well as in a later building of the Massachusetts Institute of Technology, where direct steam is used in the rooms, supplemented in the latter case by super-heaters in the flues, the control in either case being by thermostats regulating the admission of

steam to the coils. In neither case is the volume of air admitted varied in the least.

All the advantages of individual regulation of temperature for individual rooms can, however, be well secured without the use of the supplementary heaters or direct radiation in the rooms. This is done by so arranging the fan as to force the air through the main heater or around it through a by-pass, the actual passage of air being controlled by its opportunity for escape from the respective passages. From the heater and from the by-pass separate systems of piping conduct the air to the bases of the vertical flues, where mixing dampers are placed and so arranged to be manipulated from the rooms, that hot and cold air from the respective pipes can be admitted in any desired quantities. These separate volumes of air of different temperatures mix in the vertical flue and thereby regulate the temperature of the room. The mixing damper must be so designed as to in no way vary the volume, but only the temperature of the air. An arrangement of this nature has been recently introduced in the Children's Hospital, Boston, Mass., where it is working with excellent results.

As in all things else, thought and care must be given to the operation of such systems. Some one, not necessarily an expensive man, must be placed in charge, who is a mechanic and understands at least the manner of operating the system. With a double system, either of ducts or of direct and indirect, as described, due attention should be given to the primary heater, and the temperature of the air passing through it should be so regulated as to make the least demand for regulation by the direct radiation or supplementary coils. In all cases a reasonable application of brains will be the most important factor in making the system a success.

CONVENIENT TO HAVE ABOUT.

Essence of cinnamon, used as a spray, is to be very useful in driving out malaria from hospitals and sick rooms.

A solution of gutta percha in benzine (consistency of cream) is a simple preservation against rust or metal. It can be easily applied with a brush, and as easily removed by the application of benzine.

To find the length of belt when closely rolled: The sum of the diameter of the roll and the eye in inches multiplied by the number of turns made by the belt and this product multiplied by the decimal .1309 will equal length of the belt in feet.—*Power.*

A simple way of removing rust from finely polished steel without injury to the surface consists in cleaning the article with a mixture of 10 parts of tin putty, 8 parts of prepared buck's horn, and 25 parts of alcohol, then rubbing with soft blotting paper.

It is stated by the *English Mechanic* that a German engineer has devised a new method for fixing a foundation under water. By means of a powerful jet of compressed air he drives dry cement down into the sand or mud at the bottom of a stream. The action of the water immediately fixes the cement, and it becomes like solid rock.

Put a small piece of paper into strong ammonia water. If arsenic be present, a blueish color will be developed. Since copper gives a similar reaction, as a further test moisten a crystal of nitrate of silver with a drop of the fluid. If the color be due to arsenic, a yellowish deposit will be formed on the crystal.

Workers at various trades know that varnish made with alcohol will get dull and spongy by the evaporation of the alcohol which leaves water in the varnish, as all commercial alcohol contains water. It is therefore advisable to take a thin sheet of gelatine, cut it into strips, and put it into the varnish; it will absorb in the thin sheets most of the water, and the varnish can be used clear and bright to the last drop.

Many people will be interested in learning that menthol is strongly recommended to relieve itching of whatever nature it may be. It has the greatest effect in cases where scratching provokes soreness. This is particularly true of nettle-rash, certain eczemas, and the pruritus following scabies if the itch mites have been destroyed.

Plush goods, and all articles dyed with aniline colors, faded from exposure to light, will look as bright as ever after being sponged with chloroform. The methylated chloroform will answer very well, and is less expensive than the purified. Care, however, must be exercised so as not to inhale it to any large extent during the process.—*Invention*, London.

IMPROVEMENTS IN PLUMBING WORK.

The following article is an editorial taken from *Fire and Water* which has the happy faculty of saying about the right thing of everything of which it treats. We reproduce the article in full for the purpose of showing that the press not directly associated with plumbing, nevertheless is able to appreciate the improvements of the last few years. Aside from this the article is good reading and evidence that the value of good plumbing is recognized:

In the development of the mechanical arts perhaps there are none which have made such progress in the same time as that of plumbing work. A comparison of what it was in detail twenty years ago with what it is now would seem to give emphasis to the expression "there is no comparison."

Then it was simply introducing water to premises, placing a valve hopper in the basement or cellar of the dwelling, a valve water closet in the bath-room on the second story, a copper bath tub and four or five basins located in the second and third stories of the dwelling, ordinary iron soil pipe continued to the roof, and one trap on the second story under the water closet was generally depended upon for trappage of all the apparatus on the second and third stories of dwellings. The trap of the hopper or servants' water closet in basement or cellar served to trap the kitchen sink and wash tubs on basement floors. Little attention was bestowed upon the question of flushing tanks for water closets, vent pipes for traps, or any of the features for improvement incident to sanitary science relating to plumbing work.

There is no branch of mechanics connected with dwelling construction that has such an intimate and direct effect upon the health of the people as that of plumbing. Science has met the requirements and provided for the emergency perhaps a little in advance of some of the requirements of the public. In passing through the warehouses of manufacturers of plumbers' materials the fact is demonstrated that earthenware takes precedence for all decent water closet apparatus—and why should it not? In the experience of users of metallic devices for water closets none can prove a durability or a cleanliness equal to earthenware. The rule applies with equal force concerning bath tubs, wash tubs, and kitchen sink drains and slop hoppers.

The absence of superfluous wood-work about wash basins, bath tubs, water closets and in fact any piece of plumbing apparatus, has proved to be a great improvement in the matter of preventing dirt or filth of any description being hidden from observation and making it easy to remove. The use of marble and tile for flooring and wainscoting in and about plumbing apparatus is the complete attainment of cleanliness and durability.

Plumbing apparatus exposed to view has called for the skill of the artist in decorating, and what was once disagreeable and offensive to the eye is now graceful in line and ornamental to suit any and every taste.

No plumber of reputation would now think of ignoring a separate trap system, a vent pipe system, or a system of flushing tanks for water closets wherever located. No plumber of reputation will use what is called a pan or valve water closet (old fashioned iron bound trunk, with an oval or round earthen bowl), the best constructed receptacle for retaining excreta ever devised and impossible to clean or keep clean.

The introduction of syphon action water closets is certainly an improvement upon the many so-called sanitary water closets. The characteristics of syphon action are certainly desirable in water closet service. It would appear from their construction that but little area of the water closet is exposed to the air, that the concentration of flow of water under the influence of syphon action produces a solidity of water column and a velocity not otherwise attainable. Water closets of this character when first introduced had more or less complicated devices in connection with construction. Experience, however, has produced simplification in their construction, and syphon action water closets will certainly become popular in the trade and in common use in preference to others more complicated, and not so well adapted in point of cleanliness and thoroughness in action.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The question of smoke nuisance, so far as it relates to the subject of locomotives and vessels, is one of more importance than is at first generally admitted. For the comfort of cities and their healthfulness it is right and proper that ordinances should be enacted prohibiting smoke. The tugs and vessels along shore and on the river through this city, the locomotives constantly running into our depots and in the switch yards, naturally fill the air with smoke which spreads over and through valuable portions of our city. The result is bad; it is deleterious to health and ruinous to property. It is well that we have ordinances directed against the evil, and it is deplorable that greater success in its abatement is not more immediately observable. But the evil of this abundance of smoke is not confined to the city bad as it is here and in other cities. Passengers by rail and water must suffer in proportion to the amount of smoke the locomotive and furnaces on steamships make. Any one who has traveled knows the inconvenience and discomfort caused by the clouds of smoke that often enwrap the train or vessel. Long ago the riddance of smoke on sea-going vessels became a problem, and naturally enough it resolved itself in a question of fuel. The simple idea of consuming the fuel used perfectly, did not seem to dawn on the minds of those who sought the solution to the problem. It seemed to them that smoke was the natural and unavoidable result of combustion, and the character of that combustion did not seem to form a factor of the problem. Later the subject of combustion received consideration, and at a comparatively recent date the solution was found in perfect combustion, and since that time many minds have been more or less successfully working along this line.

The following communication has been sent from Kansas City, Mo., and it evidences the manner in which this problem is being solved through a more perfect combustion of fuel:

An engine on the Alton has just been equipped with a combination of improvements which are attracting the attention of railway men all over the country. The two ends to be achieved by these improvements are, first, the saving of fuel by more perfect combustion; the doing away with the back pressure in the cylinders caused by the contraction of the exhaust tubes at the point of discharge into the smokestack, in order to produce the blast for draft, and the abolition or partial abolition of the smoke nuisance; and, second, the complete lighting of the locomotive and its signal attachments by electricity, not only giving a much clearer and brighter light than oil, but an illumination that is perfectly controllable in all parts and in every way by the engineer and fireman.

The steam from the cylinder is exhausted into a pipe which, from the cylinder to the stack, has the uniform diameter of five and one-half inches. It is not contracted at the stack end as is the case in all locomotives in which the draft is caused by the blast from the cylinder. By reason of the use of this uncontracted pipe there is saved in operation all the cylinder "back pressure," which engineers claim and records show is from six to fourteen pounds to the square inch. The draft is supplied by a fan, or blower, which also is instrumental in bringing about increased combustion, by which the inventor, Mr. Cavener of Chicago, believes he can save some 20 per cent of fuel, and decrease the loss in combustion from 45 per cent., which is the accepted average, to something like 25 per cent.

Another important improvement contemplated by the inventor, but which has not been introduced in the case of locomotive No. 34, is the condensation of the steam used by the locomotive's engines. Another blower, operated by the independent engine, will be used, which will force the exhaust steam from the cylinders back, through pipes, to the tank on the tender, where, by being passed through long coils of pipe in the water, it is condensed back to water to be again used in the making of steam. It is claimed that 700 gallons of water will be a sufficient quantity to cover the loss by radiation, leakage and otherwise, and it is claimed that, with the improvement locomotives, will be enabled to run from terminal to terminal of such roads as the Alton without stopping for water. Another advantage of this improvement is that the boilers will be supplied with distilled water, and thus relieved from the destroying scale or deposit, which is so common in the use of hard water.

Other devices are applied to locomotives for the prevention of smoke, and among our advertising columns can be found devices worthy of consideration and investigation.

The fortunate circumstance connected with these smoke preventers is that they not only prevent smoke, but do it at a less cost than that with which smoke is produced. This is a fact generally overlooked, principally because those who really pay for the fuel are not brought in close acquaintance with the merits of the preventers. Purchasing agents attempt to build a reputation on reduced expenditures and are inclined not to buy anything that can be dispensed with. They do not consider the larger saving in the consumption of less fuel, but seek to avoid the first cost. In many cases the preventer is not known beyond the purchasing agent and proprietors, those who pay for the fuel, are not made aware of the existence of such contrivances. Thus the agent does not expend an amount for smoke preventers, but gradually pays out more for fuel, and it is often very difficult to get beyond this agent.

The time is coming however when ambitious and misdirected agents cannot stay the demand for smoke preventers. Aside from the removal of a great evil, their value in the saving of fuel will put them into general use. There is a growth to everything. Instantaneous development is a miracle and not of the present day. The sentiment is growing regarding smoke prevention and the good offices of these preventers are becoming better understood. This is the day of growth and it is not a discouraging one.

EXPERIMENTS ON THE STRENGTH OF VITRIFIED SEWER PIPE.

In a paper read by M. A. Howe, before the Engineers' Club of St. Louis, and published in the *Journal* of the Association of Engineering Societies, an account is given of a number of experiments made to determine the strength of American vitrified sewer pipe.

In order that a fair average strength might be obtained from the experiments, pipe was secured from manufacturers as far east as Wilmington, Del., and as far west as St. Louis, Mo., 15 different makers being represented. The pipe was subjected to the following tests:

I. The Hydrostatic Testto determine the bursting strength of the pipe and also the tensile strength of the material.

II. The Drop Test to determine the relative capacity of the pipe to resist "percussive action."

III. The Concentrated Load Test, to determine the strength of the pipe when subjected to a concentrated load.

IV. The Uniform Load Test, to determine the strength of the pipe when subjected to external pressure under the conditions found in practice.

V. The Cement Joint Test, to determine the strength of joints made of cement when subjected to hydrostatic pressure.

APPARATUS AND METHODS.

Hydrostatic Test.—In making the hydrostatic experiments to determine the ultimate tensile strength of the material composing the pipe, three methods were employed.

Method No. 1—The ends of the pipe were closed by rubber gaskets and wooden heads which were drawn together with bolts until a water-tight joint was obtained between the heads and the ends of the pipe. The pipe was then filled with water, the pump connected to the pipe passing through the upper head and water forced in until the pipe was broken.

Method No. 2.—This apparatus differed in only one particular from that used in Method No. 1—viz.: no end pressure was brought upon the bell of the pipe, the rubber gasket being held in place at the bottom of the bell by a circular, soft wooden block, which projected beyond the bell and rested against one of the wooden heads.

Method No. 3.—In this method no end pressure was brought upon the pipe, the ends of the pipe being closed with leather cups clamped between two pieces of wood which were prevented from slipping out of the pipe when under hydrostatic pressure by heads and bolts similar to those used in the previously mentioned methods. Sole leather was employed in making the cups.

Drop Test.—The pipe to be tested was supported on two pieces of pine, each two inches wide, placed 16 inches center to center, and so arranged that the falling weight would strike the pipe near its center and midway between the supports. The falling weight consisted of a wooden box filled with cast-iron cubes and weighing 18 pounds.

The end of the box striking the pipe was made of a rounded piece of hard wood. The weight was drawn up by means of a rope passing over a pulley at the top of guides. The distance passed through by the weight was regulated by a pin passing through the guide box. In making a test the weight was allowed to fall upon the pipe from a height of 12 inches and if the pipe was not broken at the end of five falls the pin was moved so that the height of the fall was 18 inches. If the pipe was still unbroken at the end of five falls from this height the height was increased to 24 inches, and so on, until a height of 30 inches was reached, which was the maximum height of fall used.

Concentrated Load Test.—The pipe was supported on two pieces of pine, each 2 inches wide and placed 16 inches center to center; the load was slowly applied midway between these supports by a compression testing machine.

Uniform Load Test.—The pipe was placed in a wooden box 18 inches wide, 18 inches deep and 3 feet long and completely surrounded with sand. Pressure was applied to the surface of the sand through a hard wood block 12 inches wide, 18 inches long and 4 inches thick by testing machine, the center of pressure being as near as possible midway between the spigot end of the pipe and the commencement of the bell. Pressure was applied until the pipe was heard to crack.

Cement Joint Tests.—The apparatus and methods used were the same as described under Hydrostatic Tests.

The results of the experiments lead to the conclusion that the average ultimate tensile strength of the material composing American vitrified sewer pipe, is, at least, 600 pounds per square inch.

2. That the average pipe will safely stand any ordinary shock or blow.

3. That the average pipe will support 2,000 pounds at its center when supported at points 16 inches apart.

4. That the average pipe will support 2,000 pounds per lineal foot when bedded in sand.

5. That cement joints made with the ordinary bell and spigot are not safe when subjected to pressure, unless the pipe is prevented from moving longitudinally.

6. That ring joints are but little stronger than the ordinary bell and spigot joints when the pipe is unconfined.

7. That the improved joint with grooves is stronger than the two mentioned above.

8. That if the pipe is confined, any of the three joints mentioned, if carefully made, will probably hold as long as the pipe remains whole.

THE FUTURE HOUSE HEATING.

Speaking of the possibilities in the line of future house heating methods, Oberlin Smith, in a recent lecture before the Franklin Institute, at Philadelphia, said:

"In the matter of warmth, there is certainly an inviting field for our future inventors. That our present methods of heating by the burning of coal and the non burning of smoke, and of cooling by carrying in lumps of ice, are crude and wasteful, as well as extremely irregular and uncomfortable, it is not necessary to argue about. It seems probable that in the near future, at any rate for our cities, some system of gas heating will displace coal and wood to a large extent, and this is the more likely from the fact that our streets and houses are already supplied with the necessary pipes, which may perhaps be gradually thrown out of use, as conveyors of illuminating gas, by the improvement and development of electric lighting. There also seems a tendency among inventors in recent years to attempt some kind of artificial cooling by the distribution through pipes of cold air or freezing mixtures of various kinds; also to contrive cheap ice making or other cooling machines, which can be economically used in individual buildings.

"All this is in a direct line of progress, but it seems probable that at some time in the future we shall depend upon the electric current brought into each building through a single wire, not only for our lighting and power, but for our heating and cooling also. Just how the latter process is to be accomplished we do not yet know, but reasoning by analogy, it would not seem outside the range of possibility, when we consider the fact that the burning of coal in a furnace can be made to produce heat or cold at will. It is true that while electric heating in itself has been proved to be perfectly practicable, yet at present it is not economical. This is owing to the fact that our best and largest steam engines by which we run our dynamos utilize only from 10 to 15 per cent. of the energy stored in the coal, lavishly wasting the remainder. Fortunately, our dynamos have reached an efficiency of about 90 per cent., so that there is not much waste in using the electric current after the power to produce it is once generated. It is probable, therefore, that the use of electric heating will for the present be somewhat limited, and confined to special places where its convenience will offset its extra cost. For an extension of its employment thus, as for certain other important uses of electricity, and upon a scale far beyond anything we can now imagine, we must wait until we learn how to produce this current of pure energy from the coal or other fuel direct. Than the accomplishment of this feat, there is to-day no more fascinating problem in the realms of science. Many are working at it with as yet but small success. We need not despair, however, as it seems to be a logical possibility, and the only thing required is to find out how to do it.

FOR THE DIGESTION.

The dishonest butcher is always willing to meat his customers half-weigh.—*Texas Siftings.*

Sometime when you have nothing else to do you can erect a whole system of human philosophy upon the fundamental fact that it is he who plays the piano poorest who always puts on the loudest pedal.—*Detroit Free Press.*

They sat for hours by the sea,
Yet flirted not, and then
The reason I found out to be
That both of them were men.
—*New York Sun.*

Jake (highly indignant)—I learn that two idiots are coming to see you now. Cora (commonplacently)—Possibly but only one has arrived.

The favorite material for "outing" suits among bank cashiers this summer appears to be "bolting cloth."—*Washington Post.*

Lawyer—"I'm not feeling very well, doctor; does it make any difference on which side I sleep?" Doctor (with a wink)—"Well, a good lawyer will never lie on the left side."—*Binhamgton Republican.*

The New York law against suicide is so severe that almost everybody there prefers to kill somebody else. And then, too, it is so much easier to get away when you have killed only the other fellow.—*Detroit Free Press.*

The Visitor—"But why become engaged if you never meant to marry him?" In the hammock—"Because he is so sensitive. You know it mortifies a man much more to be refused than to have an engagement broken."—*Life's Calender.*

Citizen Notemaker—"You give mighty short weight in your ice this summer." Frigidus, the Snow Man—"Yes, but I give mighty long wait for my pay." Citizen N. (coldly)—"O, do you? Well, 'all things come to the man who waits.'"—*Philadelphia Press.*

No matter how prompt actors may be at rehearsal, there is always one man who is prompter.—*Texas Siftings.*

Man's love for his sweetheart is often nearly two-thirds jealousy of some other fellow.—*Milwaukee Journal.*

The man who prefers to be right rather than be President has usually been heartily accommodated by the people.—*Galveston News.*

A grubbing hoe is a splendid weapon with which to fight the devil. Satan cannot follow long in a plowman's steps.—*New York Herald.*

"Charley has had such bad luck with watches," said young Mrs. Tocker. "He lost two because they got saturated." "Charley said they got soaked," remarked her mother. "I know, but

saturated is a prettier word, and means the same thing. These rains are so penetrating; I suppose they got into the works and rusted them."—*Washington Star.*

One of the hardest things in all public affairs is to keep the brass band from mistaking itself for the entire procession.—*Washington Star.*

When a person wants to elevate anything he should keep off of it. It would be well for the stage if some actors would remember this.—*Yonkers Statesman.*

"There are very few types of the former styles of beauty left," remarked the young man. "Yes," replied Miss Passeigh with a sigh, "but those who are very much so."—*Washington Star.*

Hicarde—"Still following the races, eh? Have any luck picking the winners?" Oldsport—"I am not trying to pick the winners. I've got a surer thing on plucking the losers. I'm bookmaking.—*Indianapolis Journal.*

Maud—"So you are going to marry Mr. Squibs, the reporter, are you? Why, there are dozens of better and richer men who want you!" Amy—"I know it. But just think of the account of our marriage he can have put in the papers!"—*Boston News.*

JOURNEYMEN PLUMBERS' PICNIC.

The first joint picnic of the Chicago Journeymen and Junior Plumbers' was held at Palos Park, Sunday, August 23. The rain came down in torrents, but it couldn't quench the ardor of the future master plumbers, who with their wives and sweethearts filled twenty-four cars which the Wabash road had placed at their disposal. The first train, consisting of twelve coaches, left the depot at nine a. m., and the nine hundred people which it brought to the Park enjoyed themselves hugely in defiance of the weather. The pavillion was thronged with dancers all day long, and after a dinner which would have put to shame the best efforts of a Kinsley or Delmonico, there were a number of foot-races. The slippery ground prevented any records being broken. Two suits of clothes, donated by the J. L. Mott Iron Works, and a prize of twenty-five dollars given by the SANITARY NEWS, were awarded to the winners of the races.

The second train load left Chicago at noon, but when the expectant picnickers reached the Park it was raining so hard that it was deemed best not to leave the shelter of the cars, and after a long wait at Orleans with many regrets they returned to the city.

Aside from the weather, the picnic was in every way a success. Mr. Burke, of the Journeymen Plumber's Associations was untiring in his efforts to bring about that result. The attendance was about sixteen hundred, and from the sale of privileges between three hundred and four hundred dollars were realized for the association.

PLUMBING NOTES.

The long contemplated union of the Plumbers' Union and the Gas and Steam Fitters' Union of Columbus, Ohio, has been effected, with Thomas Kelly as President, Charles Zengler, Vice-President, and Edward Burke as Secretary. The consolidated union will meet once a month as a committee of the whole for the transaction of general business important alike to both trades.

The St. Louis plumbers are probably the best organized association in the United States.

The plumbers, gas and steamfitters of London, Ont., having failed to induce their employers to reduce their hours from 54 to 50 per week and increase their wages from 23 to 25 cents per hour, have for the past three weeks enjoyed a holiday, while the master plumbers have been forced to take off their coats and "earn their bread by the sweat of their brows." The strike, which promises to soon cease, has brought a few outsiders to the city, and these, with the repentant strikers, who do not like the idea of resting without pay, are managing to keep pace with the work.

While there are some men working at the plumber's trade who cannot do good work, there are a great many who will not do bad work.

The Devon and Cornwall District Council for the national registration of plumbers met recently at the Drake Chamber, Plymouth. Dr. F. M. Williams, the medical officer of health, in acknowledging his election as a member of the District Council, remarked that the Council were doing a great deal to assist the sanitary authorities. Bad and unscientific plumbing had been the cause of many valuable lives being lost, and the national registration of plumbers was a great safeguard to the public health. On the motion of Mr. Hamblyn, seconded by Mr. White, Messrs. Rowe, Pearce, Serridge, Shuter and Andrews were appointed to wait upon the Plymouth Water Committee to ask, in the name of the Council, that only duly qualified plumbers should be employed as examiners under the new regulations of the committee.

The report of the proceedings of the Cincinnati convention has been transcribed from the official stenographer's notes and will soon be put into the hands of the printers.

The results of the May examinations of the students of the Glasgow and Greenock plumbers' classes in connection with the Glasgow and West of Scotland Technical College have just come to hand, and they are eminently satisfactory to the stutents and to the lecturer, Mr. David Fulton. The number of matriculated students in both classes last session was 150. About 80 of them took the technical examination, which lasted three hours, and of this number there have been 45 passes—11 in honors and 34 in the ordinary grade. Out of 20 of the students who went in for the practical examination—four hours work—there have been 19 passes. In the honors grade there are two prizes for the United Kingdom. The first prize is 3l. in money, with a silver medal, and it has been gained by a student of the Greenock class, William M'Alpine. This student last year took the second prize in the ordinary grade. In the ordinary grade there are five prizes for the United Kingdom, and the third, 1l. in money, with a bronze medal, has been gained by a Glasgow student, Robert Young. These good results should stir the benevolence of the master plumbers to have the education of the young plumber even more complete, and they may be reminded that there is no practical plumbers' workshop in connection with the college.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Ashland ave. and Melrose street, F. Ruh, 1204 Diversey ave.

Addison and Ashland ave., G. Hausline, Jr., 80 E. Fullerton ave,

5206 Aberdeen street, W. Bowden, 238 25th street.

295 Austin ave., Nelson & Cederholm, 87 W. Ohio street.

5415 Atlantic ave., P. Schmidt, 4928 State street.

Ashland ave. and 59th street, D. Dewar & Co., 6312 Wentworth ave.

2924 Bonfield street, F. Meek, 485 W. 18th street.

65-67 Bingham street, H. Breyer, Jr., 1706 Milwaukee ave.

Byron ave. and Mozart street, H. Breyer, Jr., 1706 Milwaukee ave.

649 Burling street, Kuhn Bros., 4111 State street.

Bryan street S. of Fullerton ave., J. Dewald, 746 Southport ave.

15 Carpenter street, J. R. Mills, 122 W. Lake street.

162 Clybourn ave., O. Roderwald, 200 Clybourn ave.

Cedar street near Wentworth ave., J. Conraths, 5902 State street.

Carpenter S. of 59th street, J. Conraths 5902 State street.

California ave. N. of Point street, W. Hogan, 1063 N. California ave.

Cloud and Dearborn streets, P. Schmidt, 4928 State street.

Central Park ave. and Wabansia street, P. Gow, 858 Rockwell street.

6143-48 Carpenter street, O. Heyman, 300 Washburn ave.

Dudley street, H. Breyer, Jr., 1706 Milwaukee ave.

2975 Deering street, J. Gormley, 3580 Archer ave.

Dudley street near Armitage ave., F. Falk, 717 Milwaukee ave.

697 David street, W. J. Hogan, 1063 N. California ave.

5336 Dearborn street, F. Babcock, 4821 Ferdinand ave.

7244 Dobson street, F. Babcock, 4821 Ferdinand ave.

Eberly S. of Belmont ave., H. Breyer, Jr., 1706 Milwaukee ave.

630-32 Erie street, Brooks Plumbing Co., 879 W. Polk street.

Euclid ave., J. Conraths, 5902 State street.

Englewood ave. near Stewart, Lyon & Lee, 6215 Wentworth ave.

18th and Washtenaw ave., C. Kostlevy, 218 W. 18th street.

808 18th street, C. Kostlevy, 218 W. 18th street.

Fullerton ave. W. of Western ave., H. Breyer, Jr., 1706 Milwaukee ave.

56th street, W. of P. & F. W. R. R., J. Evans, 4401 Dearborn street.

3347-53 and 3317-23 Fisk street, Morris Bros., 3442 S. Halsted street.

59th and Carpenter streets, J. Conraths, 5902 State street.

410 42d street, A. Miller, 4300 Wentworth ave.

Forest ave. and 37th street, P. Schmidt, 4928 State street.

189 Gault Place, E. Sheehan & Co., 222 Illinois street.

Greenwood ave. N. of Center street, J. Doyle, 6040 S. Halsted street.

Grace Place and 65th street, J. H. Bradly, 8028 Vincennes ave.

3410 Halsted street, Morris Bros., 3442 S. Halsted street.

Hawthorne and Wright streets, D. Dewar & Co., 6312 Wentworth ave.

Hunting ave. S. of Montrose, J. Doyle, 6040 S. Halsted street.

Hoyne ave. N. of Wellington, H. Breyer, Jr., 1706 Milwaukee ave.

6812-14 Honore street, William Johnston, 652 65th street.

321 Huron street, W. Muller, 387 W. Chicago ave.

Heine street N. of Cortland, J. T. Bunting, 477 W. North ave.

68 Henry street, E. Sheehan & Co., 222 Illinois street.

65 Homer street, W. J. Hogan, 1063 N. California ave.

Hoffman ave. near Milwaukee ave., W. J. Hogan, 1063 N. California ave.

Harvard and 74th street, Dewar & Co., 6312 Wentworth ave.

1959 Harrison street, C. Jurgens, 1274 W. Madison street.

Hoyne ave., S. of 32d street, Babcock, 4821 Ferdinand ave.

Irving ave., S. of Center, J. Doyle, 6040 S. Halsted street.

410 Indiana street, J. O'Brien, 293 W. Indiana street.

Kedzie ave., S. of Ohio street, M. McDonald, 383 Ogden ave.

Kedzie ave., S. of 19th street, S. Bunting, 477 W. North ave.

5212-14 Lake ave., J. J. Clark.

44 Lexington ave., J. Bunting, 477 W. North ave.

Loomis and Eighteenth streets, C. Kostlevy, 119 E. 22d street

Longwood S. of 95th street, J. Bradley, 8028 Vincennes ave.

Leavitt street S. of 34th, F. Babcock, 4821 Ferdinand ave.

Madison ave. S. of 73d street, J. & B. Rourke, 5434 Lake ave.

945 Madison street, M. G. Brooks, 1111 W. Harrison street.

216 Mozart street, W. J. Hogan, 1063 California ave.

25 Moffat street, P. Gow, 858 N. Rockwell street.

3618 Marshfield ave., C. Kostlevy, 218 W. Eighteenth street.

5921-23 Morgan street, J. H. Kilian Co., 333 22d street.

1032 19th street, C. Uher, 524 W. Eighteenth street.

Oakdale ave. nr Halsted street, M. Minzesheimer, 512 N. Clark street.

Owasco nr 43d street, Foskett & Brown, 217 Fifth ave.

260 Ohio street, Nelson & Cederholm, 87 W. Ohio street.

183-85 Oakley ave., B. F. O'Neil, 752 W. Lake street.

Park ave. and Center, J. Doyle, 6040 S. Halsted street.

1028 Park ave., W. C. Brown, 370 W. Lake street.

2410-14 Prairie ave., Foskett & Brown, 217 Fifth ave.

1025 Park ave., Maypole & Bro., 816 W. Van Buren street.

140 Potomac, Nelson & Cederholm, 87 W. Ohio street.

198 Rebecca street, Herman Mund, 2 Ambrose street.

Root and School streets, G. Geldkamp, 63d street and Madison ave.

Roscoe E. of Clark street, F. Ruh, 1204 Diversey ave.

Racine and Melrose street, F. Ruh, 1204 Diversey ave.

6637 Stewart ave., D. F. Dewar & Co., 6312 Wentworth ave.

Stewart ave. N. of Washington, J. Doyle, 6040 S. Halsted street.

Sheridan ave. and 12th street, Kretchmer & Kurz, 379 W. Eighteenth street.

6234 Sheridan ave., G. B. Kemp, 899 W. North ave.

65th street and Evans ave., G. Feldkamp, 63d street and Madison ave.

60th street bet Halsted and Winter, J. Conraths, 5902 State street.

4431 School street, A. Miller, 4300 Wentworth ave.

67th street and Langley ave., J. Emblem, 256 31st street.

4906 State street, P. Schmidt, 4928 State street.

5420 School street, J. K. Moran, 1620 Wabash ave.

622 Southport ave., G. Mertz, 2208 Archer ave.

Sherman south of 55th street, J. Bradley, 8028 Vincennes ave.

Stony Island ave. near Seventieth street, S. Smith, 469 California ave.

6840 Sherman street, T. B. Bryson, 6335 Wentworth ave.

Sangamon south of 56th street, W. R. Morrow, 750 43d street.

593 Spaulding ave., C. Kostlevy, 218 W. Eighteenth street.

1390 Taylor street, R. Robinson, 325 Washington boul.

878 35th street, Morris Bros., 3442 S. Halsted street.

Tracy ave. south of 58th street, J. Conraths, 5902 State street.

658 Twentieth street, J. Keeney, 645 Blue Island ave.

Townsend near Chicago ave., Nelson & Cederholm, 87 W. Ohio street.

291 21st street, W. Rustman, 238 W. Fourteenth street.

1193 21st street, C. Kostlevy, 218 W. Eighteenth street.

2627 Armour ave., L. Herzog, 2230 Archer ave.

8113 Vincennes ave., J. Bradley, 8028 Vincennes ave.

Wright near 78th street, D. Dewar, 6312 Wentworth ave.

Winter and Eightieth streets, D. Dewar, 6312 Wentworth ave

1426-28 Wabash ave., R. J. Powers, 90 LaSalle street.

6335-37 Wharton street, W. Bowden, 238 25th street.

88 Whipple street, J. Bunting, 477 W. North ave.

677 Walnut street, C. Jurgens, 1274 W. Madison street.

817 Wood street, C. Kostlevy, 218 W. Eighteenth street.

Western ave., south of Taylor street, Nash & Harna, 2216 Wabash ave.

Yale street north of 71st street, L. Clark, 345 63d street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Charles S. Frost has designed a 6-story hotel, 150x115x115, to be built at Rockford, Ill., by the Nelson Hotel Co.; cost, $125,000. He has also planned for the University of Wisconsin a new building, to be occupied as the College of Law. It will be built in connection with the college buildings at Madison, Wis., and will be two stories, with high basement and roof, covering a space of 84x42, with an apsis in the rear of about 60 feet in diameter; cost, $60,000. The Chicago & Northwestern Railroad will erect a pretty passenger station at Veenah, Wis., after plans by Mr. Frost; cost, $16,000. He is also planning two handsome dwellings to be built on Drexel boulevard, one near Forty-sixth street and the other at Fiftieth street; cost, $30,000 to $40,000. Adler & Sullivan have let contracts for the construction of Adolph and William Loeb's flat building, 46x182, at the northwest corner of Randolph and Elizabeth streets, to Victor Falkenau. Pressed brick and stone construction; cost, $60,000. They are also receiving estimates for the completion of the Dooley block at Salt Lake City; cost, $300,000. They have also planned a picturesque passenger station for the Illinois Central Railroad, to be built at New Orleans. Holabird & Roche have designed a very pretty village hall for Evanston. It will be three stories high, 51x150, and will be constructed of pressed brick and stone; cost, $30,000. Furst & Rudolph have designed a gymnasium, to be erected on Wells street, near Menominee, by the North Side Turner Society. The building will be two stories, 106x110. It will contain a natatorium on the first floor, with a gymnasium, 70x110x30 high in the second story; cost, $75,000. John H. Wagner has planned a 2-story concert hall, 74x179, to be erected on West Adams street, east of Halsted by George A. Chambers and others; cost, $50,000. Fred Alschlager has planned a 4-story bank and office building, 25x70, to be built at the northwest corner of Ninety-second street and Erie avenue, by John Merrill and John McCabe; cost, $16,000. He has also designed a new edifice for a German Lutheran Congregation at Dearborn and Forty-ninth streets. It will be 46x100, and will cost $12,000. Fromman & Jebsen has planned for the Walker & Birk Brewing Company a 4-story and basement store and flat building, 20x80, to be built at

Canal and Taylor streets. Pressed brick and stone construction; cost, $14,000. For John Koch they have planned a 2-story basement and attic residence, 26x55, to be built on Evanston avenue; cost, $8,000. I. C. Torbell has planned an 8-story apartment house, 50x180, to be built at the corner of Calumet avenue and Twenty-third street by Frank H. Follansbee. It will be heated by steam and electricity; cost, $125,000. Henry Ives Cobb has designed a 3-story and basement residence, 40x90, for George W. Cass, to be built at 2713 Michigan avenue. It will be lighted by electricity and heated by hot water; cost, $80,000. Kley & Lang have planned a 4-story and basement store and flat building, 48x100, for Henry Ludolph, to be built at 867-869 Milwaukee avenue; cost, $20,000. For B. Bodeker they have planned a 4-story and basement flat building, 25x86, to be built on Chicago avenue; cost, $12,000. George Beaumont has designed a 3-story and basement store and flat building, 50x75, to be built on Marshfield avenue; cost, $20,000. For S. Weise he has planned a 3-story and basement residence, to be built on South Park avenue. It will be constructed of stone with hardwood interior; cost, $18,000. For H. M. Clark he has planned a 3-story and basement flat building, 45x70, to be built on Fletcher street; cost, $16,000. William G. Ruehl has planned a 3-story and basement flat building for F. C. Cook, to be built at 1164 Adams street; cost, $8,000. For James Doyle, on Paulina street, near Taylor, he has planned a 3-story and basement flat building. It will be of stone with pine finish; cost, $10,000. R. G. Pentecost has designed a 2-story frame residence for F. Rensch, to be built at Edgewater; cost, $6,000. E. H. Turnock has planned for C. P. Hall a 2-story, basement and attic residence, to be built at La Grange. It will be of frame with hardwood interior; cost, $6,000. For L. H. Mitchell, at the same place, he has planned a 2-story frame residence; cost, $6,000. He has also planned similar residences for Mrs. Anna C. Jack, L. H. Holmes and J. B. Russell at the same place.——Philadelphia, Penn.: Architect J. Franklin Stuckert has completed the drawings for the Hotel Vendig, which is to be erected at the northwest corner of Twelfth and Market streets by a syndicate headed by Charles H. Vendig. The edifice will be five stories high, 50x100. A 9-story business house will be erected at 726-728 Market street for Abe Kirshbaum & Co., from drawings by Frank R. Watson, of 528 Walnut street. The contract has been awarded to Thomas H. Doan, the West Philadelphia contractor. It will be of faced brick, trimmed with terra cotta and Indiana gray stone.——Cincinnati, Ohio: S. Hannaford & Sons have prepared plans for a printing office building for the *Times-Star*, Walnut, near Sixth street. To be six stories, built of pressed brick, fireproofing, stone foundation and trimmings; cost, $50,000. Crapsey & Brown have plans for the First Presbyterian Church, to be erected at Winchester, Ky. To be built of common and pressed brick and stone; cost, $20,000. Des Jardens & Hayward are preparing plans for a hotel at Richmond, Ky. It will be 83x120 and four stories high; materials will be pressed brick, iron and stone, and will cost about $30,000. L. Piket has plans for the Church of Blessed Sacrament, Price Hill. To be built of common and pressed brick, with stone foundation and trimmings; cost, $15,000.——Washington, D. C.: F. G. Atkinson has plans for a row of five 2-story and cellar brick dwellings, for Myron M. Parker, to cost $13,000, at 715-717 3d, northeast. Mr. John H. Duvall will erect for himself a row of seven 2-story brick dwellings in the alley in square 1075. The houses will have a frontage of 13 feet and a depth of 28. The houses will cost between $4,000 and $5,000. Builder Frank L. Harvey will soon break ground for a residence which Mrs. F. J. Tilford will have built at 1336 New Hampshire avenue. The house will be three stories in height, with a basement 53x50, and will cost not less than $15,000. The front will be of pressed brick. G. Friebus has plans for a residence which Darby & Davis will erect for L. C. Rosenbush, at 1700 Thirty-fifth street, northwest. The house will be of pressed brick, 28x53, and will cost $6,000. ——Wheeling, W. Va.: M. F. Giesey has plans for the erection of the building for Simon Baer's Sons. It is to be six stories in height.

HEATING AND LIGHTING.

New electric light plants or extensions of existing systems are reported as probable at the following places; Detroit, Mich.; Birmingham, Ala., address the Como City Land Co.; Dallas, Tex., address the Mayor; Franklin W. Va., address W. W. Moore; Wheeling, W. Va., address W. E. Whitaker; Alexandria, Va., address F. M. Welch; Attleboro, Mass.; Stephenville, Tex., address W. C. Baldwin; New Martinsville, W. Va.; Charleston, W. Va., address the Board of Public Works; Huntsville, Tex., address W. S. Gibbs; Salinas City, Cal., address the National Electric Development Co.; Tolono, Ill., address S. Stocking; Aurora, O.; Carthage, Ill.; Napanee, Ind.; Elberton, Ga.; Mayfield, Cal.; Muncy, Pa.; Belle Fourche, S. D.; Sarcoxie Mo.; Mascoutah, Ill., address E. R. Pagist; Tioga, Pa.; Ithaca, Mich.; Cambridge, O.; Leslie, Mich. The following electric light companies have been recently incorporated: Grand Haven Electric Light & Power Co., Grand Haven, Mich.; capital stock, $10,000. Hughesville Electric Light & Power Co., Hughesville, Pa.; capital stock, $10,000; G. S. Moyer, Treasurer. Wagner Electric Light Co., St. Louis, Mo.; capital stock, $25,000; incorporators, H. A. Wagner, G. E. Claffin, E. G. Ellis and others. Radford Water, Light & Power Co., Radford, Va.; capital stock, $1,000,000; incorporators, J. J. Doran, F. J. Kimball, J. H. Dingee. Poland & Minot Water, Electric Light & Power Co., Mechanics Falls, Me.; capital stock, $25,000; incorporators, E. E. True, N. D. Pope, J. M. Libby. Dixon Light & Heat Co., Dixon, Cal.; capital stock, $60,000. Kensey Wright Electric Elevator Co., Denver, Col.; capital stock, $25,000. Brighton Water & Electric Light Co., Brighton, Col.; capital stock, $20,000; incorporators, W. H. Malone, W. C. Kidder, J. McKeon. Citizens' Fuel, Light & Power Co., Celina, Cal.; capital stock, $50,000; incorporators, A. F. Marsh, S. S. Scranton, T. P. Touvelle and others.

SEWERAGE NOTES.

Nantucket, Mass.: A sewerage system is projected.——Burnside, Conn.: a sewerage system is proposed.——Meriden, Conn.: Plans have been prepared by Mr. McKenzie, of Southington, all for sewers 30, 36 and 40 inch diameter. The estimated cost is $130,000.——Roanoke, Va.: The plan suggested in the report by Mr. Rudolph Hering has been adopted.——Birmingham, Ala.: The City Engineer has been directed to prepare plans and specifications for about 13 miles of sewers for the south side.——Salem, Ohio: A sewerage system is projected.——Vincennes, Ind.: A sewerage system is to be built according to plans by Mr. E. F. Fuller, of New York.——Trinidad, Colo.: The old portion of the city will have sewers. N. W. Wall is making the surveys and plans.——Seattle, Wash.: Mr. Benezette Williams, of Chicago, has presented to the Board of Public Works his plans and report for the sewerage system.——Phoenix, Ari.: A sewerage franchise has been granted to Frank Baxter and J. L. B. Alexander.——Stockton, Cal.: The Board of Public Works has adopted plans and advertised for bids for main sewers.

WATER WORKS NOTES.

Lake Charles, La.: The Lake Charles Ice, Light and Water Works Co. has been incorporated; capital, $100,000.——Greenville, Tenn.: H. Reaves informs us that a franchise can be obtained by a good company.——Lawrenceburg, Tenn.: It is reported that works will be built by J. W. Garrett.——Harrodsburg, Ky.: Sept. 19 the people vote on granting a franchise to J. A. Geary and J. M. Roche, Lexington. Seventy-five hydrants are proposed at $50 each per year.——Mayfield, Ky.: We are informed that the Mayfield Construction Co. wishes bids for 10 to 4-in. mains, and laying same, valves, lead and a stand-pipe.——Madison, Me.: It is reported that works will be built by the Madison Water Co., including a 500,000 gallon reservoir or stand-pipe and 25 hydrants. ——East Epping, N. H.: Works are projected.——Kingston, Mass.: Aug. 24 a meeting will be held to consider water-works improvements.——West Stockbridge, Mass.: It is reported that the company will extend a main across the river to supply Albany st.——Winchendon, Mass.: Works are talked of again.——Newport, R. I.: The company has received permission to extend its mains into the town of Middleton.——Tacoma, Wash.: A Citizen's Water Commission of 11 members has been appointed to investigate water-works. Nelson Bennet and W. J. Thompson are on the commission.——Brighton, Col.: The Brighton Water and Electric Light Co. has been incorporated; capital, $20,000.——South Sioux City, Neb.: C. D. Smiley informs us that this and an adjoining town could be supplied from one system. Population,

2,500 each. The people wish works, but no action has been taken. ——Great Falls, Mont.: It is reported that the company proposes to extend its mains, and erect a 48x50 ft. stand-pipe.—— Marcellus, Mich.: J. J. Nash informs us that the village talks of building water works, with a supply pumped from wells to a stand-pipe; cost, $6,000. An election will probably be held soon to decide the matter.——Beardstown, Ill.: H. M. Schmoldt, Mayor, informs us that the people have just voted for works and that a hydraulic engineer is wanted. Population, 5,000.——Litchfield, Ill.: The Litchfield Water Supply Co. has been incorporated; capital, $15,000.——Brodhead, Wis.: We are informed that complete works are talked of. The village has an artesian well with a slight flow and has put in a few rods of 6 and 8-in. pipe for fire protection.——Sandy Creek, N. Y.: The people have voted to build works. Proposed supply, brook, 205 ft. above Main st.—— Troy, N. Y.: Prices are wanted on 3,000 to 5,000 ft. of 8-in. pipe. ——Walton, N. Y.: It is reported that the Walton Water Works Co.'s application for a franchise has been granted, the terms being the same as those of the present company's franchise. Supply, Howland's East Brook Pond.——Plainfield, N. J.: The Plainfield Water Supply Co. has requested permission to extend its mains to supply North Plainfield Borough.——Madison, N. J.: It is proposed to issue additional water and light bonds to the amount of $15,000.——Blossburg, Pa.: Works are projected.—— Mansfield, Pa.: A franchise is to be granted to L. A. Waters and L. Amerman, Scranton. There will be 40 hydrants.——Dixon, Cal.: The Dixon Light & Water Co. has been incorporated; capital, $60,000.——Susanville, Wash.: It is reported that a 22-in. main, 4 miles long, will be laid.——Provo, Utah: J. E. Rhodes, Denver, Col., is trying to secure a contract to build works for the city.——Blissfield, Mich.: It is stated that works will be built for the east side of the town.——Youngstown, O.: J. D. Cook, Toledo, has reported on improvements including a new supply from impounding reservoirs on Mill Creek and a stand-pipe. Estimated cost, $300,000.——Butler, Ind.: The people have voted to put in works.——Carthage, N. Y.: Moffett, Hodgkins & Clarke estimate the cost of works including 6 miles of mains and about one mile of rock trenching, at $54,000.——Tarkio, Mo.: We are informed that material for works will be bought at once, including about three miles of 4 to 8-in. cast-iron mains and a stand-pipe. Address Water Co.

BIDS AND CONTRACTS.

St. Louis Mo.: Bids will be received by the Board of Public Improvements until Sept. 4 for about 2,500 tons 6 to 36-in. cast-iron pipe, 100 tons specials, 250 fire plugs, and 188 6 to 20-in. stop valves; also for hauling, trenching for and laying 75,000 ft. 6 in., 45,500 ft. 8-in., 20,000 ft. 12-in. pipe, and setting 200 fire plugs. E. S. Foster, Secretary.——Dallas, Ore.: Bids are wanted for lining reservoir, 31,500 sq. ft., and receiving basin, 10,350 sq. ft., with asphaltum. C. L. Phillips, Secretary Water commissioners.—— Beatrice, Neb.: Proposals are wanted until Sept. 8, for making extensive improvements to the local water works system. Address O. V. P. Stout, city engineer.——St. Louis, Mo.: Bids are wanted until Sept. 4, for mains, castings, hydrants, etc. Address E. S. Foster, secretary of Board of Public Improvements.—— Metropolis, Ill.: Until Sept. 10, bids will be received for the construction of water-works and electric lights.——Atlanta, Ga.: Sealed proposals will be received until Sept. 16 for furnishing cast-iron pipe and specials. Address G. W. Terry, secretary of water-works.

THE AHRENS & OTT M'F'G. CO.

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HENRY OTT, SECY.
THEO. AHRENS, JR., TREAS.
LOUIS AHRENS, SUPT.

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ILLINOIS SMOKE PREVENTOR CO.,

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The advertising rates are reasonable, and will be furnished on application.

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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

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Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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PLUMBERS have not only advanced with the age but they have recently advanced the age in regard to sanitary plumbing.

IT need not be expected that the public can of itself keep pace with the plumbers in the science of plumbing work. It must be educated up to a proper realization of the importance of plumbing properly done. The most efficient educator in this regard is the national and local association of master plumbers. From these sources have gone out literature and information that have done much in enlightening the public as to the value of good plumbing.

THE extra cost of good plumbing above that of the bad is more than repaid in the increased value good plumbing gives to property. When builders fully comprehend this, skin plumbers will find their occupation gone.

THE demands of crowded cities make plumbing a necessity. There is no possible way of doing without it, and its use makes possible our large and compact buildings when nothing else could. Good plumbing is just as safe as pure water or air. The belief of some that all plumbing is bad is unfounded. Good plumbing is not only a necessity, but it protects the home from disease that would otherwise afflict the household.

FILTH DISEASES.

Just what constitutes a filth disease has not been clearly defined. Many diseases come under this general class by a kind of common consent without any scientifically arranged classification. Typhoid fever has been so clearly described as a filth disease that it has been said by a prominent physician on being asked more than a century ago how to maintain health, replied, "keep clean." While it is difficult to connect any disease with a state of cleanliness, there are certain diseases which from their nature are spoken of as filth diseases in distinction from others not so classed.

Dr. S. W. Abbott in summing up his observations relating to the question, "what constitutes a filth disease," concludes that a filth disease is one in relation to which filth in some form or other, either wet or dry, plays part of an important factor only in its causation, but is not itself the direct cause; that it acts either as a favorable soil for the propagation of disease germs (other favorable conditions also existing), or as a suitable medium or vehicle for the transmission of the particular contagium from the sick to the well. The filth which promotes the spread of infectuous diseases is specific filth, and the importance of removing all filth lies in the fact that thereby we are sure to remove the specific filth, or that which contains the germs of infectious disease. The point to be emphasized is, that when filth is removed it should be done with the principle in view that filth is a condition rather than a cause, that it is the soil for the culture and transmission of infection, and not the infection itself; and that, just as far as the principle of infection is deprived of its proper soil, so far is one of the most important conditions of its growth and propagation removed. In sanitation, careful watching and provision against the introduction of infectious disease, issolation of the sick, disinfection of houses, clothing, and other associated material are as essential as the removal of dirt.

It is clearly true that filth may not be the direct cause of disease, or the disease itself, yet it is a condition through which disease can easily enter. It is also shown that filth is a breeding ground for disease germs, and that some kinds of filth is a better culture for germs than others. It has also been observed that germs will live longer in certain filth than others, and the kind of filth is a factor in solving the problem of filth diseases.

The most harmful of substances which tend toward producing disease in the home are poisonous gases which rise from the refuse and soil in the house and from decaying matter. Some claim that sewer gases are harmless, but the weight of opinion is against them. Many diseases have been traced to defective plumbing, and there is no doubt that bad plumbing is responsible for much sickness. When one considers the nature of the gases which rise from the filth in the sewers, he cannot believe that they are harmless. Whatever tends to reduce vitality tends to a low order of health and renders disease easy access to the system. Filth may not be the disease or the most immediate cause but is

in the beginning responsible for many ills. No one can breathe the vitiated air caused by bad plumbing and be healthful, so in removing filth and maintaining the highest state of cleanliness, good plumbing and drainage should be the first to receive careful consideration.

SUBSTITUTION AND ADVERTISING.

It seems that a craze of some kind has struck the press, especially the daily press. Some years ago we heard something of "substitution," meaning that druggists, principally, were in the habit of working off on their customers some other article than that for which they called. It attracted little attention at the time, but lately it seems the entire daily press has grown into a passionate rage about the matter. An advertising man at a recent editorial association read an essay on the subject, and, as if by a preconcerted arrangement, the press went into a wild and wailing fury about the stalking crime of substitution. It was first noticed as a matter of news, then the editorial wrath poured out upon it, and finally the "marked copy" and the electrotype got in their deadly work. We have received hundreds of "marked copies," and so has the waste basket. Circular letters often accompanied these marked copies requesting the editor to make mention of this most horrible crime. Well, we did not. The scheme was too transparent. Even in the editorials of reputable papers the advertising scheme stood out plain as a wort on the nose. It was noticeable that in writing about this offense, mention was made of some well known patent medicines for which substitution was made by a certain class of druggists. At last to clap the climax the New York *World* came lumbering along in a wrapper stamped "marked copy," and in it was an editorial denouncing this crime. The editorial was "marked" with emphasis. Above and below the editorial were heavy cuts about the size of a lead pencil and about the curve of a quarter of a circle of a six-inch diameter, obliterating the columns of reading matter in two places. We now think this marking business has gone to its extreme, and for the sake of decency in newspaper publication a halt should be called.

There is one of two things about the whole business: The newspapers have been handsomely paid for such work or they have been woefully duped. It cannot appear otherwise to any one who viewed the matter sufficiently close not to be consumed with enthusiasm and enterprise, and go to work reprinting "marked" articles and racking his brain for new ideas against this high-handed assault on the peace and honesty of commerce. We are not in that kind of business or that kind of a market. We most emphatically favor honesty and fairness in everything. We do not uphold the practice of substitution, but that it is practiced to the extent that these advertisements would indicate, we seriously doubt. There has been something like a tempest in a teapot about the whole affair and if we are not mistaken it will descend like a boomerang on the heads of the instigators. Bad as substitution has been made to appear, we cannot class it among frauds greater than this means of advertising.

Another objection we have against the whole business is that it is advertising articles that have already done their full share of evil. The principle articles sought to be advertised in this way are proprietary medicines, and to their existence can be attributed evil enough for the human family to suffer. There may occasionally be a patent medicine found to possess some virtue but the chances are against it. These medicines are advertised to cure every ill flesh is heir to. The poor spend their hard earned savings in them and suffer on, when a part of the money spent in this way would secure a reputable physician to treat them properly. Some of these nostrums contain opiates and are the direct cause of wrecked lives. Thus it is, and because the proprietors of the drugs spend millions in advertising, then the press is flooded with such stuff as we have had lately.

It is claimed that when a person goes to a drug store and asks for some of these dead-wall, plank-fence, high-rock and circus-bill advertised nostrums the druggist suggests that he has something better for less money, etc. The chances are that if the druggist has anything harmless to offer, he has something infinitely better. He can say this and tell the truth in nine cases out of ten, and is doing the purchaser a good turn besides.

In most of the states there are laws against the practice of quacks, and yet they sit back in our cities, flood the country with advertisements and sell millions of dollars worth of their stuff every year. In Germany there is a law which provides that if a proprietary medicine does not accomplish that for which it is advertised, the proprietor is held responsible. This is a good law and should be the law in every state in this country, yet it does not reach the root of the evil. Many are the innocent victims of these nostrums and the source is not known. The increase of these so-called medicines is alarming. The sale of these articles has doubled within a year in England and is on a rapid increase in this country. Should druggists substitute something harmless for them they would in a majority of cases prove a blessing.

We have nothing to say in favor of unfair and fraudulent practices in trade or advertising. We do not uphold the druggist in deceitful practices, nor do we approve of some schemes of advertising, and this is a gentle hint that the time and money spent in sending us marked articles relating to this subject are wasted. The foregoing is the result of this marking business, and if there is an advertisement in it for those interested, they are entirely welcome to it.

NOTES AND NEWS.

The German emigrants outnumber the Irish two to one every year.

Danzig officials have discovered that bacillary infections can be communicated by the "membranes" of telephones.

Borings are being made eight or nine miles above the Forth Bridge, England, with a view to determine the practicability for tunneling under the river.

The earth is gradually growing larger from the fall of meteoric matter. An astronomer estimates that the globe is annually being pelted with 143,000,000 projectiles.

It has been estimated that the amount of gold in coin or ornament in the world is about 613 cubic yards, and that it would fit in a room 24 feet each way if in a solid cube.

The Shan Chinese, a people living between Burmah and China, show their love for their parents by killing them and eating them to save them from the misery of old age.

A Frenchman has succeeded in making commercially pure chloroform. Heretofore this has been considered its impossible. As the impurities in chloroform are generally the cause of fatal effects the Frenchman's achievement is regarded as very important.

A recent departure in obtaining extra draught for furnaces on steamships without the use of blowers or other devices has been successfully tried on the Scot, of the Cape Mail line. This vessel has been furnished with smoke stacks 120 feet high above the grates. The increased draught is equivalent to a water pressure of three-fourths of an inch.

A common source of cold and discomfort in winter is the draught from the bottom of a shrunken or badly fitting door. A device has been brought out by which these currents of air can be so diverted as to be made desirable instead of objectionable. A slab of wood works on two pivot hooks projecting from the bottom of the door, and fitted at one end with a curved piece of wood, which comes againt the jamb on closing the door and presses a felt-facing close to the door. On opening the door an India rubber spring draws the bottom of the slab toward the door, and so clears the carpet. The bottom edge of the slab, being lined with felt, is absolutely draught-tight. On the door being shut the air which rushes in strikes against the slab, is turned upward, and goes to the top of the room. In this way the draught under the door, which was before a constant menace to the health of the occupants of the room, becomes a positive advantage in promoting the thorough ventilation of the apartment.

The bureau of police of Vienna, according to the Wiener *Extra Blatt*, issued a circular recently, which strikes a heavy blow at the liberty of women. The fair Austrians have already protested against the circular; their foreign sisters, it is believed, will aid them in their crusade against its execution. "The high imperial and royal government," reads the circular, according to

the papers, "has under consideration the question of the advisability of denying women the privilege of wearing trains to their dresses on the public streets. The federal sanitary council of Lower Austria has expressed the opinion that the wearing of such trains should be forbidden, as they raise the dust and thus aid in conveying the germs of infectious disease to the lungs. The practical execution of a measure forbidding the use of such trains, however, is coupled with many difficulties, as are all measures dealing with excesses in style. In accordance with the wishes of the imperial and royal government, the commissioners of police are requested to present their views upon the necessity and availability of such a measure." The *Extra Blatt* fails to inform us of the reports of the medico-Worths of the Viennese police.

The street cleaning of New York for 1892 will cost $2,653,233, according to Commissioner Beattie's estimate. This is an advance of more than a million dollars on the appropriation of 1891, which was $1,584,250. The working plant proposed includes 1,700 patrolmen, 600 carts and drivers, and 88 hostlers. This force will cost $1,494,888. Salaries foot up to $38,400; supervision, $162,600 carts, vans, horses, harness, etc., $309,120; disposition of material, $275,000; horse shoeing and feeding (650 horses), $118,625; temporary labor in removing snow and ice, $100,000; rent of offices and 11 stables, $60,000; repairs and renewals of plant, $40,000; contingencies, $20,000, and police, $73,000. In the final disposal of street refuse by contract, Mr. Beattie estimates the value to the contractor of the "scow trimmings" at $5,460 per month. Much of the increase in the present estimate is due to the increased pay of $2.00 per day for patrolmen, cart drivers, hostlers, etc.

"FRESH AIR PIPES."

BY JOHN F. GERRARD, ST. CLOUD, MINN.

Editor THE SANITARY NEWS: Referring to the article of Mr. Hosford in your issue of August 15th, concerning the "fresh air pipe," as plumbers call it, it would seem that the pipes of this kind referred to by Mr. Hosford were badly placed, else the difficulty which he describes could not have occurred.

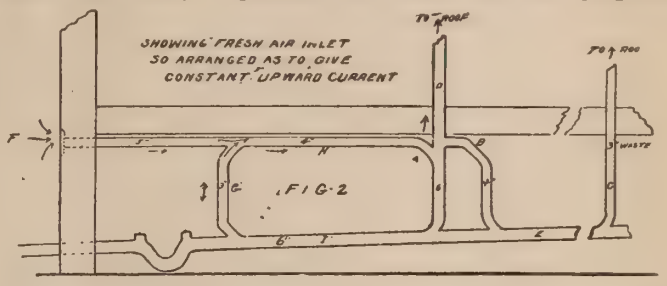
Many other city ordinance besides that of New York compel the placing of the trap in the house drain, and the fresh air pipe as its necessary attendant. This is true of my locality. My practice is to raise this pipe about a foot above the sidewalk, terminating in a goose neck in the case of a vertical pipe, and a quarter bend in case of a horizontal pipe. In pipes thus placed there is little or no danger of obstruction. It is plainly absurd to call these pipes, "fresh air pipes," since they throw out directly under the noses of any who may be passing or standing near them, all the noxious gasses of the house drain at each discharge of the fixtures in the plumbing system of the building.

A discharge of water from a water closet, accompanied by the foul contents of the closet, acts like a piston upon the air below it; which being forced forward, and meeting with the obstruction of the water seal in the house drain trap, is forced up with a strong pressure through the much smaller fresh air pipe to the open air at the sidewalk as already described, loaded as it must be with the sickening and dangerous gasses of the house drain.

Reprehensible and evil as I believe the "fresh air pipe" to be, and glad as I would be to see it take its place among the abominable unsanitary contrivances of the past, I cannot say that I see deliverance in Mr. Hosford's new idea, as shown in Fig. 2, one of the illustrations which he presents. That it will work in practice as indicated by Mr. H. may well be doubted. Air has a way of behaving strangely, and often, as we think, quite improperly; and very often upsetting all our ideas of what we think it ought to do under certain particular circumstances. Inertia is as natural to air as to a stone, and it will not move sooner than the stone, unless some external force is acting upon it. When heat is applied to a volume of air it rises by the law of gravity, being expanded by the heat, and made lighter than the surrounding air; and the vacuum which its rising would tend to create, is prevented by the colder neighboring air rushing in to fill its place. In this way air currents are produced, and they most naturally travel towards the highest point of the conduit.

Another means of moving air is by mechanical pressure, and it is this force which produces most of the movements of the air through the pipes of a plumbing system. Of course it is not denied that currents of air do move through such pipes by the force of gravity; but such currents are spasmodic and irregular, and by no means uniformly towards the roof of the building. Circumstances may and do often operate to move the air downward from roof, to and out through the fresh air pipe.

Now, it can hardly be believed that there is anything in the arrangement of the pipes in Mr. Hosford's new system as shown in Fig. 2 that can insure a constant current in at F, and out at the roof end of the pipe, even if left free from the movement of air in the opposite direction, as the result of mechanical pressure. But let us consider the operation of this mechanical force acting within the pipes of a plumbing system at each discharge of the plumbing fixtures. Such a discharge from the large tank of a water closet nearly or quite fills the house drain like a plug and



rushes through it. This rapidly moving piston, rushing downward through the perpendicular pipes, is more likely to draw the air out at F than at any other point in Mr. Hosford's new system, which is exactly where it would go out in the old system. Why? Because as the piston advances, the air in the pipe is compressed and driven forward, seeking relief always at the point, of least resistance. Of course there can be no movement of air from the point F to fill the vacuum left behind the advancing piston, since such movement is cut off by the piston itself; and this vacuum is filled as fast as produced by air following down the ventilating stack behind the piston, which, as it advances, is operating on all the air in its front, and forcing it out at F, as the point, or certainly one of the points, of least resistance.

Let any one at all familiar with the subject in hand, with Mr. Hosford's Fig. 2 before him, imagine this water piston which having passed down vertical pipe either C or D is now passing along the nearly horizontal pipe I, meeting the resistance of the water seal in the drain trap, it rises through the vertical pipe C to horizontal pipe H, along which a current of air is already moving outward towards F, into which its volume joins, adding to its pressure and accelerating its motion. To suppose it would take any other direction would remind one of a dog making a frantic effort in a roundabout chase after his own tail. Suppose even that the air in pipe H, instead of moving towards F, should be at rest at the time of pipe G delivering its air into it, still it would not take the direction of the roof of the building, but towards F as the point of least resistance.

Owing to the much shorter conduit Mr. H. must excuse me, if, with my present light, I consider his new scheme no better than the old, with the added objection that it is more costly.

I shall have something to say later concerning the trap in the house drain, and its companion—"the fresh air pipe."

ATMOSPHERIC POLLUTION—GERMS AND THEIR CULTURE.

The following is represented from the *Plumber and Decorator* London: "There are more things, twixt heaven and earth, Horatio, that are dreamt of in our philosophy." My theme is atoms, to which Shakespeare's ideal atom, "no bigger than the round little worm pricked from the busy finger of a maid," hugely colossal; they are—Dr. Burrel calls them—"our invisible foes."

Air and water are essential to the existence of all known life. Bodily health is supported by taking quantities of both at short intervals. Both may, and often do become the vehicles of deadly poison.

It is a fact that chemical analysis fails to show a dangerous contamination of water, and will always fail to detect the specific poison of the water affected with discharges of an infectious nature.

Water should be kept free from all possible means of contamination by sewage. Perfect cleanliness can only guarantee safety. There is nothing so important to all animal creation, yet so heedlessly regarded by the mass of mankind.

A man breathes about 18 times a minute, and uses about 3,000 cubic feet of air per hour.

It is only of late years that we know with what we have to deal to prevent the spread of infectious diseases. Impure air should never be breathed, nor should preventable causes be allowed to pollute the air.

Contagia or infection consists physically of minute solid particles; the process of contagion consists in the passage of these from the bodies of the sick into the surrounding atmosphere, and of the inhalation of one or more of them by those in the immediate neighborhood.

The minute organisms capable of inducing changes analogous to fermentation have lately received great attention, and several important diseases has distinctly traced to them.

Man's invisible foes, the bacteria, which swarm through the air, infest decomposing materials, are minute organisms, 1-25th of the 1,000th of an inch in diameter, and which may under favorable conditions multiply at the rate of 300 billions in 48 hours.

Dr. Dallinger, F. R. S., and Dr. Drysdale, in their "Recent Researches in Micro-organisms," have found that the most powerful lens was powerless to reveal any trace of organic structure in the little speck of protoplasm known as bacteria termo, 50,000,000 of which lie together in the 100th part of a square inch. In putrescent animal and vegetable matter it is the first organism to appear; it has the power of locomotion, it takes in food and assimilates it, it secretes, and its power of multiplication is enormous. This creature can execute powerful, rapid, and graceful movements; it was found to possess a flagellum at each end, so delicate as to have a width only of 1,204,700th of an inch, and by their action it makes wavelike leaps, somewhat like a shoal of porpoises, and yet this thing of life and rhythmic movement is, so far as man can see, but a speck of structureless jelly.

The multiplication of these lowly organisms—it is only 1-5000th of an inch in length. Before the act of fission began in the form it gathered itself into a little ball of jelly. Watching this protoplasmic speck under a power of 3,000 or 4,000 diameter, its substance was seen to be intensely agitated, and fissures, which deepened into clefts, showed themselves all over the sphere. The whole mass then began to writhe like a knot of eels, and in the course of from seven to thirty minutes the different portions separated and swam away, fully equipped forms, and soon attained the parent size.

On another monad fertilized parental products were observed, and seen to grow from egg to adult; the fluid emitted in this instance, even under the highest powers of the microscope, showed at first no trace of granules in it; but after watching through a lens magnifying 5,000 diameter, the minutest conceivable specks became visible. "I can only compare," says Dr. Dallinger, "the coming of these to the growth of the stars in a starless space upon the eye of an intense watcher in a summer twilight." Once detected, the development of these sporules was followed until it reached the parent stage.

The most satisfactory experiments show that though the adult form of micro-organism was killed at 140°, its spores does not cease to germinate until a temperature of 290° F. has been attained, but that all germs passing from the sewers into the air we breathe can be rendered safe by passing through gauze wire heated to 300° to 400° F.

Careful research has shown that sewer gas is not of itself poisonous. Average analysis gives 73 per cent hydrogen, 16 carbonic acid, 10 nitrogen, with traces of sulphuretted hydrogen and ammonia, accompanied with a putrid organic vapor. Not one of these gases is capable of producing the diseases attributed to sewer gas; it is the vapor or fume containing the infinitesimal infectious atoms that is added to the air in the sewers, by the breaking of the sewage bubbles on the surface, and they are carried with the light hydrogen from the sewers into the air we breathe that is the cause of the diseases associated with and spread by sewers.

When this poison invades a dwelling either from interior or exterior sources, the lives of the people are jeopardized as positively as if they were compelled to breathe a mephitic gas. That decaying organic matters, more particularly animal excretions, give rise to a subtle blood poison, which as yet evades chemical analysis, is a positive deadly fact. This improper care and disposition of effete matter will poison air, water, and soil. The evil effects of sewer air are due to these products. Against this disinfectants are wholly if not quite useless. Their supposed value rests on a false basis; they produce a false sense of security, as we are apt to forget that the germs carried by the sewer air retain their vitality long after the odor is gone. Diphtheria is contagious and infectious, the poison retains its vitality from three months to two years.

The true value of disinfectants was proved by Professor Frankland in his experiments with mutton broth, infested with live vermin and swarming with organisms; various gases were introduced into the globes, and a course of contact with the liquid, teeming with bacteria, oxygen was tried; hydrogen, nitrogen, and carbonic acid also. They got on as well in oxygen as they did in carbonic acid. The bacteria seemed to delight equally in any one of them, could live for weeks in nothing but pure carbonic acid. Cyanogen was then introduced, and they certainly did sink a little under it; they recovered in the course of a week or so, and went on living in that gas in a fairly healthy condition. Sulphurous acid gas was then introduced. The broth and the air saturated with it seemed to have very little effect upon them; their motions were not stopped, and they seemed to be as lively after the application as before it, and the same was the case with several other reagents. These experiments prove that there is only one true disinfectant—viz., fire, for sewer air.

Every gallon of average sewage gives off 1¼ to 1½ cubic inches of gas per hour. Every 100,000 gallons of sewage gives off in the twenty-four hours during its travels through the sewers between 7,000 and 8,000 cubic feet of infectious air into the atmosphere, and our chronic institutions of typhoid, scarlatina, small-pox, and diphtheria kill more annually than the dreaded cholera.

The "heathen Chinee" gently hint that we are barbarous. A moment's reflection will prove that it is loathsome and barbarous to allow the acme and quintessence of filth, the sewer air, to pass unpurified into the air we breathe; so we must plead guilty to the soft impeachment. Probably the Chinese, in their great contiguity, profitted by the fate of those modern cities, Thebes, Babylon, Nineveh, where sewers were introduced and the inhabitants swept away by pestilence. By Rome's cloacæ and marquesa and its malaria, they have learned that sewage air, "like the fabled Upas, blights all healthy life and makes a desert around it." If they had had sewers and neglected the effiuvium as we do, they would never have possessed a population of 400,000,000.

A beneficent and well-intentioned Government recognizes and provides against this proved primary source of disease in Section 19 of the Public Health Act, 1875, which enacts that every local sanitary authority shall cause the sewers belonging to them to be constructed, covered and ventilated, so as not to be a nuisance or injurious to the public health, and to be properly cleansed and emptied; and this evil is rampant still, and his Satanic Majesty provides the necessaries to carry out the conditions—or else the governments wink at and encourage covertly this Mathusian doctrine.

Since the passing of the Public Health Act, 1875, the deaths from zymotics or preventable diseases, per Registrar-General's reports average 90 to 100,000 per annum—that is, nearly a million souls sent to their account before their time, with all these imperfections on their heads, in the ten years since the passing of the Act; and as only one case in ten is fatal, the sickness, distress, and misery caused by this official neglect is appalling.

"The laws were made for the unjust." Is the local government board and its ramifications above the law? Does the law of nations apply to them in the sense that wilfully to kill one person is murder, pure and simple; to kill thousands is to make the hero, whether the weapon is the sword or sewage? It is a familiar doctrine that persons are not to be held liable for the remote and indirect consequences of these acts, but only for such as might reasonably have been anticipated and guarded against.

This wise principle was affirmed by Lord Bacon. The deaths from zymotics or preventable causes in April, May, and June,

1885, were, per Registrar-General's report, 14,183—that is, a death from preventable causes every eight or nine minutes. The sewer air is the principal factor in spreading these miasms. Why not cremate the air at the exit from the sewers, where it is perfectly under control? In the selection of the means for so doing, the authorities must prove that it is efficient to increase, and not in any way impede the ventilation of the sewers; it must be constant in its action, and act entirely independent of atmospheric changes; and that it is so constructed that not one single embryo atom of disease can escape.

A SANITARY EXHIBIT AT THE WORLD'S FAIR.

The *Herald* of this city contained the following article in its issue of August 27:

Andrew Young, late chief inspector of the health department and general manager of the SANITARY NEWS, has this to say about a sanitary exhibit at the World's Fair: "The advancement of the science of sanitary engineering should be one of the foremost purposes of all intelligent men engaged in the profession. By comparison of the various methods in use at the present time much may be accomplished. By a study of the experience of the past the thoughtful mechanic and engineer may learn not a little that may be useful for his guidance, and enable him to achieve results that shall lead to the perfection of systems that shall be pregnant with benefit to the world at large and to humanity in general. The primitive mode of thrashing wheat by pounding it upon a stone suggested the flail, and that in turn gave rise to the idea of the thrashing machine. And so it has been in every branch of mechanical industry. Progress has sometimes been slow, but there has been a constant advancement for centuries, and to-day it appears as if perfection had been attained in many of the domains of artisanship.

"Such is not the case, however. The intelligent artisan of to-day need not, like Alexander of old, sigh for more worlds to conquer. They are at his door awaiting the advance which shall transform that which is seemingly impossible into that which is not only possible but practicable. All that is necessary to the accomplishment of such results is mutual co-operation and consultation—comparison of ideas and an intelligent and forceful application of that which shall seem to be most applicable and necessary to the public needs.

"An opportunity will be afforded to plumbers, manufacturers, inventors and sanitary engineers at the World's Fair to add largely to their store of knowledge and public usefulness. There should be an exhibition at this display of the world's industry, commerce and intellect—a complete and comprehensive collection of all the appliances that have been devised for the proper sanitation of our homes and cities. Everything that experience has shown to be practical in that direction should be displayed by means of working models or other means which shall best illustrate their uses and application. That this department of the great fair may be complete in its every detail there should be the heartiest co-operation of every member of the craft in every portion of the country. The interest in such an exhibit would not be confined to those directly engaged in the trade. It would prove a center of attraction for sanitary officials from every quarter of the globe, and for those interested in the improvement of the habitations of man in every nation. It would illustrate also the superiority of the sanitary systems of this country over those of other nations and inevitably lead to the adoption of our methods by other nations, as well as to the introduction of our appliances in the more progressive cities of other continents. The exhibit will not only be interesting but profitable, and the craft cannot afford to permit the opportunity to pass unimproved. We are sure the matter will commend itself to all having the best interests of sanitary science at heart."

HOT WATER HEATING.

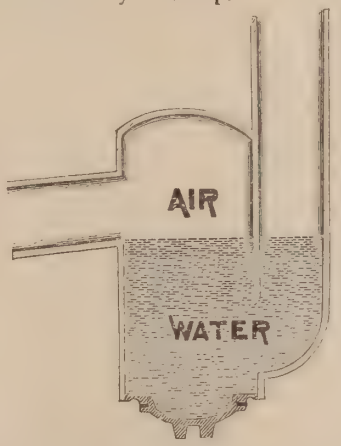
NILES, Mich., August 27th, 1891.—Editor THE SANITARY NEWS:—Your issue of August 8, contains an article from the *The Heating Engineer* in which the writer attempts to show that hot-water systems that use a small amount of water should work most economically. The notion, though quite common, is erroneous. The radiation depends on the surface of the radiator and is not influenced by its capacity, so that, other things being equal, radiators of equal surfaces, though of unlike capacity, should fnrnish equal amounts of heat and so return the water at the same velocity and temperature. The writer carries the idea that difference in temperature of the flow and return is evidence of good circulation; or, at least, that if a radiator is so planned as to create such a difference by limiting its capacity, the circulation will be better. It is true that difference in temperature is the motive power of circulation, but such difference indicates retardation. The quicker the circulation the nearer alike are the flow and return.

The principal advantage in apparatus that uses little water lies in the fact that it is quicker to heat and quicker to cool off where only a temporary fire is needed as is frequently the case in spring and fall use. W. G. BLISH.

THE CLEAN SWEEP NON-SIPHON SEWER GAS TRAP.

In accepting your invitation to furnish you with an article descriptive of our trap for publication, we, with some doubt as to our ability to do justice to the many good features of our trap, respectfully submit the following description of the Clean Sweep Non-Syphon Sewer Gas Trap. In the Clean Sweep Trap we have combined the two best possible forms of trap: The S or bent pipe trap, and the pot trap. The S trap finds favor for its self-cleaning qualities with some, while the large water seal of the pot trap commends it to others. It is too generally known that the S trap, either vented or unvented, is not always reliable to require more than casual mention, while the general objection to the pot trap is based on its liability to accumulate filth, which in time will stop it up. This, however, is owing entirely to the construction of the trap and its proportions. The pot trap is usually made by hand, there being no rule for making it and each plumber has his own idea as to how it should be made.

Usually a piece of 4 or 5 "inch soil pipe, from 9 to 12" long, is closed on one end and a trap screw soldered into the other. The inlet is placed in the side close to the bottom, the outlet on the opposite side as near the top as possible. This will leave a body of water 4 or 5 inches in diameter and from 6 to 9 inches deep, and here is where the mistake is made. The inflow from an inch and a half or even a two inch pipe is not sufficient to keep this large body of water in circulation, but only agitaes the lower part for a short distance above the inlet, while the upper portion is almost dead, retaining any matter entering the trap in suspension until the flow from the fixture ceases, when if falls to the bottom, forming accumulations which will in a short time destroy its efficiency as a trap.



In the Clean Sweep Trap, by properly proportioning the body with the inlet and outlet we have entirely overcome the fouling feature of the pot trap retaining its large water seal and adding the self-cleaning qualities of the S trap. The Clean Sweep Trap is therefore the best trap made owing to its proportions, which no other trap made posseses.

There have been many experiments to produce a trap which would not syphon, a trap which would hold its seal against any and all forms of syphonic action, capillary attraction, evaporation, and other menaces to its seal. As a result there have been several traps produced which employ various means to achieve their object.

Some depend largely on a ball or other valve, while others rely on partitions or reflections of various forms. But any one of these is in a greater or less degree an obstruction to the free flow of water through the trap and must in time become filthy. In producing a self-cleaning pot trap we have not lost sight of the importance of providing it with some means to prevent its syphoning.

We have, above the outlet of our trap, a supplementary chamber, which will under any and all conditions preserve a perfect water seal. The accompanying cut shows the trap in section with the water seal at rest. When the fixture is used to

which the trap is connected the trap fills entirely with water, which remains in the supplementary chamber during syphonic action, and when such action ceases falls to the bottom, making a perfect seal.

When a syphon is exerted on the trap by a fixture connected to the trap as its outlet the action is as follows: The first effect on the trap is to exhaust the air in the supplementary chamber the water being heavier than the air. This leaves a vacuum in the upper half of the trap. To fill this vacuum the air from the house side of the trap must either pass through the water in the trap, which the body being larger than the inlet it readily does, in which case the air in passing through the water having been slightly compressed, on reaching the vacuum will expand forcing the water to the bottom and breaking the syphon, or else the water must be drawn into the supplementary chamber allowing the air to pass through below it and so break the syphon, when the water will fall to the bottom; in either case making a perfect seal, which cannot be destroyed by repeated syphons.

The inner surface of the Clean Sweep Trap being perfectly smooth throughout, the danger to the seal through capirlary attraction is reduced to the minimum, there being no partitions or obstructions of any kind to catch lint or other substance.

The danger of a trap having its water seal destroyed through evaporation has undoubtedly been greatly exaggerated. The greatest danger from evaporation lies in vented traps, which have a steady current of air passing over the seal, while the Clean Sweep, requiring no vent, has a space of dead air in contact with the water seal which does not permit of circulation, thus reducing the danger of evaporation to the minimum. In short the Clean Sweep Non-Syphon Sewer Gas Trap, is in every respect the most perfect protection against sewer gas yet placed before the public, and, relying entirely on its proportions and the elements of air and water, is placed on the market entirely on its own merits.

Detroit Sanitary Supply Co.,
Detroit, Mich. C. H. Muckenhirn, Manager.

CONVENIENT TO HAVE ABOUT.

The following tests for water will be found useful for sanitary and other purposes:

The *American Machinist* says that vaseline is one of the best things for preventing bright iron work from rusting.

Test for Lime.—Into a glass of water put two drops of oxalic acid and blow upon it. If it gets milky lime is present.

Test for Hard or Soft Water.—Dissolve a quantity of good soap in alcohol. Let a few drops fall into a glass of water. If it turns milky it is hard; if not it is soft.

Test for Earthy Matters or Alkali.—Take litmus paper dipped in vinegar, and if, on immersion, the paper returns to its true shade, the water does not contain earthy matter or alkali. If a few drops of syrup be added to a water containing an earthy matter, it will turn green.

Test for Carbonic Acid.—Take equal parts of water and clear lime water. If combined or free, carbonic acid is present, a precipitate is seen, to which if a few drops of muriatic acid be added, an effervescence commences.

Test for Magnesia.—Boil the water to a twentieth part of its weight, and then drop a few grains of neutral carbonate of ammonia intoa glass of it, and a few drops of phosphate of soda. If magnesia is present it will fall to the bottom.

Test for Iron.—Boil a little nut gall and add to the water. If it turns gray or slate, black iron is present. Second: Dissolve a little prussiate of potash, and if iron is present it will turn blue.

Test for Acid.—Take a piece of litmus paper. If it turns red there must be acid. If it precipitates on adding lime water it is carbonic acid. If a blue sugar paper is turned red, it is a mineral acid.

Test for Copper.—If present it will turn a bright polished steel a copper color. Second: A few drops of ammonia will turn it blue if copper is present.

Test for Lead.—Take sulphurated gas water and equal quantity to be tested. If it contain lead it will turn a blackish brown. Again: The same result will take place if sulphate of ammonia be used.

Test for Sulphur.—In a bottle of water add a little quicksilver, cork it for six hours, and if it looks dark on the top and on shaking looks blackish, it proves the presence of sulphur.

The following substance, it is said, will protect cement from the influence of acids: Melt together carefully one part of caoutchouc (India-rubber) with two parts of linseed oil, and gradually incorporate with it three parts of white bole, so as to form a plastic mass. This cement is not at all attacked by hydrochloric, and but very little by nitric acid. When heated it softens but very little. It does not easily dry upon the surface. *New Remedies* says, if this cement is mixed with one-fifth of its weight of litharge or minium, it dries up in the course of time and becomes hard. This is known as Benicke's cement.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

When such a condition prevails regarding the smoke nuisance that the residents of a certain portion of our city go about with petitions, have them extensively signed, praying for the abatement of the smoke nuisance, it is pretty good evidence that something is wrong. That the black volumes of smoke which are defacing our city, ruining property, damaging business, giving Chicago a bad reputation, and injuring health, are not being abated is a fact clearly visible every day. It is not necessary to tramp over the city to discover this. It may be seen from every corner and almost from every window. It is not only an immediate injury to the citizens of Chicago, but it is an injury which will retard business and harrass commerce with other cities. A bad reputation for polluted water supplies, dirty streets, or impure air is of a direct and continual menace to the city's prosperity and progress.

We published last week the view a New Yorker took of the matter, and all must confess such articles as that going the rounds of the press is not favorable to our city. But what can be done? How can such expressions be denied? We must endure the truth of whatever injury it may be. One cannot contradict such statements when he looks out of his window and sees the truth of them issuing from chimneys, blackening our fine buildings and the reputation of our city. It is perhaps true that the best way to have the evils remedied is to tell the truth about them. New York is a great way from Chicago, yet it knows how futile have been the attempts here to prevent smoke, and it does not hesitate to speak of it. If we could frame an excuse at all plausable for this state of affairs we would gladly do so, but there is none. If an excuse can be given us we will as gladly publish it, but we do not believe there is one to be made.

The Sanitary News has taken up this subject, sincerely believing that this great evil can be materially lessened if not entirely removed. It thoroughly believes that this has been fully demonstrated, and it is not alone in this belief. It also believes that the importance of the abatement or prevention of smoke is great enough to call forth every effort that will tend to accomplish this end. Every important interest in the city is involved. There is not a single interest in the many and diversified interests of this great city that is not harmed by smoke—not one, from the least to the greatest. Yet day by day goes by and we have nothing but promises, growing dimmer and dimmer in the dense clouds of smoke permitted to blacken our buildings and pollute the air. There is little room to hang the faintest hope on these promises. The daily press regardless of political faith continues to mention the location of bold offenders, but they continue to pour forth smoke in a disgusting abundance, mocking the very power of a great city established and provided with the means for smoke abatement. It is a sad reflection when we are brought face to face daily with the evidence that the great city of Chicago is powerless in matters of so great moment to its prosperity—too weak to lay its hands on individuals and firms and make them obey the law. Is the city a child that it is to be toyed with in this manner, or is there a weakness somewhere in the agencies that have been provided for the enforcement of the law?

Smoke will not prevent itself. That is self-evident. That there are means by which it can be prevented has been acceptably demonstrated. Then the question for consideration seems to be, How can these means be utilized and by what methods may

their use be compelled? The city ordinances provides abundantly for this. That point need not be argued. It is fixed on our statutes. The enforcement of these laws will set to work the discovery of these means which can be found within the city. We need not take up space in telling how the ordinances can be enforced. This is so old that it is as a national hymn with the people. Coming down to the court of last resort and the power behind thrones, mayors and appointees, we find the people clothed with powerfor the redressof every evil. If the appointed channels through which law is administered are defective, the fortunate opportunity and right are bequeathed to the people to make new channels. It is not only the theory but the fact that the people have their will carried out through chosen servants—servants who are paid by the people and their tenure of office depending on the will of the people. It is not the theory but the fact that the people can straightway provide servants able and willing to carry out their wishes.

When such an institution as the County Hospital goes on as it has done violating the law and disregarding the right of the people, by permitting its furnaces to emit stifling volumes of smoke, we have all the evidence we need that smoke will not prevent itself or the producers of smoke prevent it. When we observe the action of citizens in sending forth a petition praying for a relief, and asking for rights that should have been theirs naturally, we behold the power in whose hands unmistakably lie the means of securing relief from the evils they have suffered. Attacked in this manner preventers have been provided the furnaces, and we have no doubt that the devices applied will prove their utility and necessity. This is a step forward in the right direction. People suffering from this evil have power of petition for the redress of grievances, and no such petition can be ignored. It is a pity that the right of petition should have to be resorted to. An attempt to remedy these evils should be made by our officials as a matter of right and not a matter of must. They are not ignorant of the will of the people or of the evils of smoke or of the shameful presence of smoke. There is little glory or credit in discharging a plain duty under the spur of a petition, and we truly hope to see successful efforts put forth for the abatement of the smoke nuisance at an early day.

GROWTH OF BACTERIA FROM SEWAGE AND EFFLUENTS FROM CHEMICAL PRECIPITATION.

The following is from the report of the Massachusetts State Board of Health:

When a nuisance is produced by sewerage in any way, the direct cause is usually the development of organisms fed by the organic matter nitrogen compounds of the sewage. To secure the absence of organisms in any pond or stream, where food is present, is a hopeless task. It thus happens that while the organisms are the real cause of the trouble, their removal from sewage is often of less importance than the removal of the matter in the sewage on which they feed. The proportion of organic matter removed does not necessarily represent the proportion of food for organisms removed, for some kind of organic matter are no more suitable food for bacteria than is sawdust for horses. An effluent from a sewerage filter, where nitrification is complete, containing 2 per cent. of the total organic matter of the sewage, will not serve as food for bacteria, because it has been worked over already by bacteria in the filter, and nearly everthing available has been removed. If, on the other hand, sewage is mixed with 50 times its volume of pure water, so that it contains the same amount of organic matter as the effluent, the bacteria will increase enormously for a few days. From this point of view, the effluent is many times purer than is indicated by the ratio of its organic matter to that of the sewage. With sewage precipitation the case is entirely different, for here there is no bacterial action.

There is, however, some reason to think that the organic matter left is not so good a food, and, therefore, not so dangerous, as that removed. Sewage settled alone will keep turbid with organisms, and in a day or two masses of zoogloea (dead or resting bacteria) seperate from it. Sewage precipitated by either copperas, ferric sulphate, or alum in suitable quantities, has repeatedly remained so clear that the bottom of the barrels could be distinctly seen through more than 2 feet of liquid, for one or two weeks. In these cases no flakes of zoogloea, so characteristic of untreated sewage has been seen, and the odor is much less than that of sewage alone.

This question of the quality of the organic matter left by the precipitation has not been sufficiently investigated but the indications are, that it is more objectionable than the same amount in the effluents from sewage filtration through sand, but less objectionable than that in sewage.

When untreated sewage is put into a small stream or pond, it often happens that the suspended matters settle out, forming considerable deposits, which, putrefying out of contact of the air, give rise to very offensive gases. It is hardly probable that well-precipated sewage would do this, for almost no suspended organic matter is present when it leaves the settling tank, and very little soluble matter is precipated on exposure to the air.

Another nuisance which might be caused by putting precipitated sewage into a stream or pond, is the growth of algæ—green plants fed by the ammonia of the sewerage. It may be said, however, that this growth would be no greater than that caused by filtered sewage; for, in the latter case, while the ammonia is removed, nearly an equivalent of nitrate is formed, and this serves as food for algæ almost as readily as ammonia.

A number of fishes were put into precipitated sewerage. In each case the fish died within five minutes. This sudden death cannot be due to the chemicals used, for it was found that the fishes lived for a considerable time in solutions of the chemicals much stronger than those present in the sewage. The fishes died for want of air. Sewage contains no dissolved oxygen, and, if any is absorbed from the air, it is quickly taken up by the organic matter. The precipitated sewage also contains no oxygen.

CONCLUSIONS.

Using lime as a precipitant, it has been found that there is a certain definite amount of lime, depending upon the composition of the sewage, which gives a better result than less, and as good or a better result than more. This amount of lime is that which exactly suffices to form normal carbonates with all the carbonic acid of the sewage. It is possible in a few minutes, by simple titration, to determine approximately the amount of uncombined carbonic acid present in sewage, and how much lime will be required to combine with it. It is also possible to determine in a similar way, after mixing, whether enough or too much lime has been added. The amount of lime required by Lawrence, Mass., sewage averages about 1,600 pounds per million gallons.

Ordinary house sewage is not sufficiently alkaline to precipitate copperas, and a small amount of lime must be added to obtain good results. The quantity of lime required depends both upon the composition of the sewage and the amount of copperas used, and can be calculated from titration of the sewage. Very imperfect results are obtained with too little lime, and, when too much is used, the excess is wasted, the result being the same as with a smaller quantity.

After mixing the sewage with both copperas and lime, if enough or too much lime has been used the mixture will color phenolphthalein red, while, if too little has been used, no color will be produced. This test can conveniently be used by people having no knowledge of chemistry, and affords an easy and very accurate method of applying enough lime, and of avoiding a useless excess.

Using in each case a suitable amount of lime, the more copperas used the better the result; but, with more than one-half a ton per million gallons, the improvement does not compare with the increased cost.

Some acid sewages contain a considerable amount of iron in solution, and in these cases precipitation by lime is really the rendering available of the copperas already in the sewage, and so is properly classed as an iron treatment rather than a lime treatment. In this case the reaction with phenolphthalein shows the presence of enough lime.

In precipitation by ferric sulphate and crude alum, the addition of lime was found unnecessary, as ordinary sewage contains enough alkali to decompose these salts. Within reasonable limits the more of these precipitants used the better is the result, but with large quantities the improvement does not compare with the increased cost.

Using equal values of the different precipitants, applied under

the most favorable conditions for each, upon the same sewage, the best results were obtained with ferric sulphate. Nearly as good results were obtained with copperas and lime used together, while lime and alum each gave somewhat inferior effluents. The range of these results was, however, comparatively narrow; and it may be that, with sewage of a different character, or with variations in the prices of the chemicals, it would be advantageous to use copperas with lime, or even alum. When lime is used there is always so much lime left in solution that it is doubtful if its use would ever be found satisfactory, except in case of acid sewage.

It is quite impossible to obtain effluents by chemical precipitation which will compare in organic purity with those obtained by intermittent filtration through sand.

It is possible to remove from one-half to two-thirds of the organic matter of sewage by precipitation, with a proper amount of an iron or aluminum salt, and it seems probable that, in some cases at least, if the process is carried out with the same care as is required in the purification of sewage by intermittent filtration, a result may be obtained which will effectually prevent a public nuisance.

REVIEWS AND NOTES.

The most conspicuous feature of the forthcoming September number of the *Review of Reviews* will be an elaborate political article upon the Hawaiian Queen and her kingdom. The article is admirably illustrated with portraits of the Queen, the young Heiress Apparent, and the principal public men who are in authority or wield controlling influence at Honolulu. The special timeliness of the article is due to the manner in which it discusses the international relation of the Sandwich Islands, and particularly the recent negotiations which have sought to secure for the United States an exclusive control of the best harbor in the islands for a naval station and to establish such special relations as would amount to a protectorate. The article is written by a high authority in Honolulu, and will arouse the keenest interest in diplomatic and governmental circles in Europe and America. All the world now recognizes the immense strategic and commercial importance of the Hawaiian group in view of the rapid development of North Pacific trade, and in view of the approaching completion of the Nicaragua Canal. The discussion of Mr. Blaine's recent negotiations, and the Canadian attempt to render them unsuccessful will be read with very marked interest in both countries.

The *Century Magazine* will celebrate the 400th anniversary of the discovery of America by publishing a Life of Columbus written especially for that magazine by Emilio Castelar, the famous Spanish orator, statesman, and author. The work is written in Spanish, and will be carefully translated. Senor Castelar, whose interest in and admiration for America are well known, has made a careful study of the new historical material bearing upon the subject, and it is said that his papers will be very richly illustrated. Other articles dealing with the discovery of America are in course of preparation for the same magazine.

Membership in the American Medical Association.—This is obtainable, at any time, by a member of any state or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues. Attendance as a delegate at an annual meeting of the Association is not necessary in order to obtain membership. On receipt of the above amount the weekly Journal of the Association will be forwarded regularly.

FOR THE DIGESTION.

He (to Boston girl)—"You are 'up' on geology. Can you tell me what kind of rocks these are we are sitting on?"

Boston Girl—"To the unengaged they are trap; to the engaged they are gneiss."—*Life.*

Miss Smilax—"I like to waltz with you Mr. Wooden; but why don't you ever reverse?" Wooden—"Well, I have reverses enough in my business without bringing them into my pleasures."—*Boston Courier.*

Traveler—"What is that tall chimney for? Some one putting up a factory?" Citizen—"Naw. That's Jim Bisbee's well. Cyclone turned it inside out."—*Indianapolis Journal.*

The Ruby—"Well, old hoss, you seem to have been in a good many engagements." The Diamond—"I'm a little disfigured it's true, but I'm still in the ring."—*Brooklyn Life.*

Jagson—"How'd the Exscamp's clambake come off?" Podds—"Kind of a fizzle." Jagson—"How's that; did the clams give out?" Podds—"Nope; the beer!"—*Binghampton Republican.*

The editor's waste basket is proof that he is always prepared for the worst.—*Boston Courier.*

"When does your vacation end?" "Next week. Then I'm going home to have a good rest."—*Cape Cod Item.*

"This is a regular skin game," remarked the banana peel to the sprawling pedestrian—*Binghampton Republican.*

What is the difference between kleptomania and stealing?" "O, say, from $100,000 to $1,000,000."—*New York Herald.*

"Henry is a great headworker," said the fond mother. "He won several prizes at college for sculling."—*Washington Star.*

It is not strange that very few men know themselves intimately. Most people like to get rid of disagreeable acquaintances. —*Texas Siftings.*

He—"The trouble with Jack is that his income is so large he can't spend it all." She—"Why doesn't he become a Harvard student, then?"—*Life's Calendar.*

"Do you know how to cook?" he asked. "No," she replied, sweetly, "but pa has money enough to hire a woman to do the cooking for us."—*Somerville Journal.*

"I wish I were like champagne," he sighed. "Ah," she queried. "Yes," he continued. "It sparkles so." "And it pops sometimes," she mused softly, but he was too stupid for any use.—*Detroit Free Press.*

"What music do you usually play at your hops?"

"O, Meyer-beer, of course."

"Don't you ever come to lager-heads over it?"

"Well, not enough to justify any one indulging in a 'pop.'"—*Philadelphia Press.*

He—"I thought your country straw ride was all arranged." She—"O no. It won't be ready for a week yet." He—"Why the delay?" She—"We are going in two wagons, and we have got to classify the people who don't speak to each other."—*Brooklyn Life.*

Contrary to the belief of some pessimistic people, gratitude still exists in the nineteenth century. An eccentric old bachelor who died in Hamburg, Germany, a few weeks ago, left among other bequests 12,000 marks to a buxom widow of his native city. "I leave this money," he wrote in explanation of his gift, "as proof of my gratitude for your refusal to become my wife thirty years ago. To your praiseworthy act I owe my life of peace and prosperity."—*New York Tribune.*

A SWEET FUEL.

Molasses as a fuel is seriously suggested by *The Planter*, of New Orleans. The large sugar crop of Louisiana for the present year promises increased trouble in getting rid of the lower grades of molasses, the output of which will probably reach 300,000,000 pounds. The molasses is sold for 5 to 7 cents per gallon when a customer can be secured; but the bulk of it is wasted by either running it into huge pits or into the river and bayous. It was formerly converted into rum, and this would seem to be a profitable enterprise at present prices. But *The Planter* now proposes to use it as a substitute for coal as fuel on the plantations. This journal figures out that the lowest grades of vacuum pan molasses contain from 20 to 25 per cent. of sugar, which cannot be extracted by existing machinery. Estimating a barrel of such molasses to be worth, net, 50 cents or $1, and a barrel to hold 550 pounds of molasses, the molasses would be worth 1 or 2 cents a gallon, and from 1-11 to 1-5 cents a pound. Pittsburg coal brought to the sugar house furnace has for about 10 years cost 1-5 cents per pound. This molasses burns with a high heat in combination with wood or wood fiber, so that by sprinkling it on the *bagasse* (the dry stalks of the sugar cane after the saccharine juice has been

pressed from it) an excellent fuel of great heat power is obtained. In this way, estimating that only half the molasses produced is used for fuel, a substitute will be furnished for 75,000 to 100,000 tons of coal. That is more than enough for the manufacture of all the sugar of Louisiana.

SOIL AND SEWERAGE FILTER BEDS.

As a result of experiments made by the Massachusetts State Board of Health on the influence of soil on a sewage filter bed, the advantages and disadvantages are stated as follows in a recent report of the Board:

The experiments have been limited to fine soils, quite retentive of water.

With a depth of 5 feet of soil no purification by nitrification occurred when the quantity filtered was only 7,500 gallons per acre per day; and the organic nitrogenous matter in the effluent was nearly as great as in the applied sewage. It is known, however, that for several months the average number of bacteria in the effluent was only one in 25,000 of the number applied to the filter; and it is probable that none lived to pass through the filter.

With the ordinary depth of soil resting on yellow loam, as it is often found in this state, and this underlaid by 4 feet of good filtering sand, we find that only about 9,000 gallons of sewage may be filtered upon an acre daily, with the result of removing 99.5 per cent. of the organic matter, and probably removing all of the bacteria; while, if the soil and loam be removed, the underlying sand may be able to filter three times as much, or 30,000 gallons per acre per day, giving an effluent as pure, chemically, as when covered with soil, but not removing so completely the bacteria—allowing ordinarily a small fraction of 1 per cent. to pass through the filter.

For filtering sewage upon the margin of a drinking water stream, a large area covered with fine soil, or a smaller area of very fine sand, would be preferable to a much smaller area of coarse sand, or a mixed sand and gravel, in that the former could be so managed that no bacteria could pass through. For filtering sewage on any land that does not drain into a drinking-water stream, the covering of fine soil is a disadvantage. The quantity applied to it must be kept very small, or nitrification and purification will be prevented. The smaller areas of sand can be made to give as good an effluent chemically, with all the reduction in the number of bacteria that is necessary.

PLUMBING NOTES.

Drainage Inspector Hughes of Philadelphia, has sent a communication to the Board of Health meeting calling attention to a violation of the rules by Frank Hodges, a master plumber. The inspector claimed that while making repairs at the house of Dr. L. P. Posey, 1435 Walnut street, Hodges neglected to submit plans for the approval of the inspector and to apply for an inspection. He also complained of the use of improper materials, defective and leaky joints, causing damage to the building and contaminating the surrounding atmosphere by foul gases, which menace the health of the occupants of the house. The inspector said that the work was done in a most incompetent way, and suggested that Hodges name be striken from the list of registered plumbers and that his certificate of registry be taken from him. The communication was referred to the house drainage committee.

It is an old joke to say that dentists punch holes in people's teeth so that they may have the profitable job of filling them, and that plumbers make work for themselves by purposely creating new breaches in the plumbing which they are hired to mend; but the humor of the allegation has depended upon the popular acceptance of it as an exaggeration. New York City, however, contains a plumber who has proceeded from jest to earnest, and systematically made a leak every time he mended one. The ingenious fellow not only made leaks, and instructed his employes to do so, but systematically reported them to the health office, so that the owners of the buildings received official notification to have them immediately repaired. The plumber's name is Bischoff. One of the victims of the ingenious Bischoff detected the practical and profitable jocosity to which that artisan was resorting, and, deciding he was carrying his jokes too far, had him arrested. The humorist and his confederate employes now languish in jail, and the joke, if there is any, appears to be on them.

The Stewart Ceramic Company report a rapid growth in the interest shown in their Solid White Crockery goods, as indicated by an increase in orders from the outlying Western trade, since the opening of their new office and show room at 323-5 Dearborn street, and 60-2 Plymouth place, this city. Among the fine residence work in which their goods have been used during the past month, may be mentioned the following: Five houses, Oakenwald avenue between Forty-fourth and Forty-fifth streets, Mr. George Otis, owner, Harry A. Black, plumber; two houses, 4521-3 Ellis avenue, Mr. C. E. Follinsby, owner, Harry A. Black, plumber; residence of W. R. Stirling, Esq., 1616 Prairie avenue, M. J. Roughan, plumber; residence of Frederick Keller, Esq., 534 LaSalle avenue, Robert Griffith, plumber; residence of A. L. Deane, Esq., 4520 Woodlawn avenue, Harry A. Black, plumber. The following residences are to be fitted up with these goods, when ready to receive them: Residence of J. O. Armour, Esq., Thirty-seventh place and Michigan avenue, L. B. Dixon, architect; residence of William G. Hibbard, Esq., 1830 Calumet avenue, Charles S. Frost, architect, P. Nacey, plumber. The company expect to issue a new edition of their catalogue and price list shortly, large size, elegantly printed and profusely illustrated. They also expect to introduce something expensive and attractive in the way of advertising specialties into the market in season to influence the fall trade in their direction. An inspection of their ware on exhibition at their show room is cordially invited, and courteous treatment will be accorded to all inquiring parties.

Intelligence reached the city recently, says the Steubenville *Herald*, that the firm of Anderson Bros., at Anderson's landing, W. Va., had failed for a large amount. An exact statement of the liabilities is not given, but one item is a judgment by confession in the Hancock county court for $30,000. A large sum is also due the employes, and a brother-in-law, Mr. Standish, of Pittsburgh, holds a deed of trust on the works for a considerable sum advanced. The firm is composed of J. E. and D. B. Anderson, and operates an extensive sewer pipe and fire brick manufactory a short distance above the mouth of King's Creek.

Our cheerful friend Keeler of the Wolff Manufacturing Co. entertained in his usual running manner, the following plumbers from abroad. Although he took them to see the goose-egg game between New York and Chicago, there were no goose-eggs on Keller's string when he bid them good bye: James Madden, Fort Wayne, Ind.; Mr. Ward, of Michigan City; Mr. Barrett, of Joliet, Ills.; Mr. Scanlon, of Elgin, Ills.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

1395 Adams street, D. Jack, 882 W. Lake street.

Adams ave. and 71st street, J. N. Wittich, 76th street E. of S. Chicago ave.

30 Breslan street. T. F. Rock, 204 Blue Island ave.

146 Bunker street, John Welch, 475 S. Halsted street.

1216 Belmont ave., W. Bletsch, 930 Sheffield ave.

2914 Canal street, M. Weber, 477 26th street.

8753 Commercial ave., Webster, Crombie & Henderson, 9243 Commercial ave.

Champlain ave. near 47th street, J. Degnan, 3304 Cottage Grove ave.

Cuyler bet. Lincoln and Robey streets, George Groll, 886 N. Halsted street.

Cottage Crove ave. and 29th street, M. Minzesheimer, 512 N. Clark street.

8733 Commercial ave., Webster, Crombie & Henderson, 9243 Commercial ave.

266 Cortland street, H. Dreyer, Jr., 1706 Milwaukee ave.

Diversey and Ashland ave., J. Scheur, 737 Lincoln ave,

647 Davis street, Harvy & Mose, 665 North ave.

6503-09 Drexel boul., J. F. Kurz, 3108 State street.

612 California ave., J. Garvey, 478 S. Leavitt street.

1246 Diversey ave., John Lenz, 357 Larrabee street.

8908 Escanaba street, Webster, Crombie & Henderson, 9243 Commercial ave.

84th street and Buffalo ave., Brunt Bros., 9115 Erie ave.

163 Eighteenth street, W. Daniels, 406 Western ave.

Emerald ave. S. of 59th street, J. Gannon, 6212 S. Halsted street.

10418 Ewing ave., Webster, Crombie & Henderson, 9243 Commercial ave.

Eberly ave. near Centre, H. Breyer, Jr., 1706 Milwaukee ave.

623 Fremont street, T. Conway, 614 63d street.

601 42d street, Morris Bros., 3442 S. Halsted street.

517-19 Fifteenth street, Dornbos Bros., 573 W. Eighteenth street.

60 Fulton street, P. Harvey, 540 E. 39th street.

Forest and Franklin aves., M. Minzesheimer, 512 N. Clark street.

609 55th street, J. Gannon, 6212 S. Halsted street.

59th street near Emerald ave., J. Gannon, 6212 S. Halsted street.

Fletcher street, W. of Paulina, P. McCabe, 1715 N. Ashland ave.

Fairfield ave. and 22d street, Steiner &McFarlane, 918 W. 21st street.

41st street, E. of Grand boul., Nash & Harna, 2216 Wabash ave.

164 Frankfort street, H. Breyer, Jr., 1706 Milwaukee ave.

160 Gault place, A. A. Sommers, 80 E. Chicago ave.

Greenshaw street, W. of Kedzie, T. F. Rock, 204 Blue Island ave.

Hoyne ave. and Superior street, D. Tierney, 537 W. Lake street.

496 Hastings street, W. Rustman, 238 W. Fourteenth street.

1939 Harrison street, Charles Jurgens, 1274 W. Madison street.

Halsted street N. of Cornelia, H. Bauer, 232 E. North ave.

3607 Indiana ave., Hugh Watt, 300 Dearborn street.

1470 Indiana street, J. Connell, 235 W. Harrison street.

3233 Laurel street, Morris Bros., 3442 S. Halsted street.

Leavitt N. of School street, G. Hauslein & Son, 1197 N. Halsted street.

2061 LaSalle street, J. Teutsch, 2961 Wentworth ave.

1228 Lexington ave., W. Daniels, 406 Western ave.

Lexington ave. N. of 65th street, J. Gannon, 6212 S. Halsted street.

241 Linden place, William Bletsch, 930 Sheffield ave.

8453 Mackinac street, A. L. Thompson, 9138 Erie ave.

Madison and Clinton streets, J. Scheuer, 737 Lincoln ave.

1825 Melrose ave., V. Ruh, 548 Wells street.

227 Mohawk street, H. Bauer, 232 E. North ave.

Michigan ave. N. of 115th street, J. Gannon, Michigan ave. and 111th place.

Mozart and Armitage ave. H. Breyer, Jr., 1706 Milwaukee ave.

1942 Milwaukee ave., H. Breyer, Jr., 1706 Milwaukee ave.

157 Madison street, A. W. Bensinger, 173 31st street.

Madison street near Halsted, T. Conlin, 3903 Cottage Grove ave.

132 Newton street, T. Foley, 646 Noble street.

98th street and Ave. J., Brunt Bros., 9115 Erie ave.

92d street and Superior ave., Brunt Bros., 9115 Erie ave.

93d street, west of Stony Island ave., J. Cannon, Michigan ave. and 111th Place.

623 Nelson street, P. McCabe, 1715 N. Ashland ave.

252 Ohio street, Harvy & Mose, 665 North ave.

115th street, east of C. & E. I. R. R., J. Cannon, Michigan ave. and 111th Place.

111th street, west of State, J. Cannon, Michigan ave and 111th Place.

389 Orchard street, V. Ruh, 548 Wells street.

5006 Paulina street, A Miller, 4300 Wentworth ave.

468 Paulina street, John Wilkie, 262 Ogden ave.

Palmer street, G. Franklin, E. Ravenwood Park south of Sunnyside Park ave.

2633 Portland ave. J. Teutsch, 2961 Wentworth ave.

3804 Park ave., Watson & Davidson, 301 Wabash ave.

Park ave. near Gardiner street, H. Breyer, Jr., 1706 Milwaukee ave.

190 Richmond street, Harvy & Mose, 665 North ave.

790 Rockwell street, Harvy & Mose, 665 North ave.

Sunnyside and Ravenswood Park aves., H. Bauer, 232 E. North ave.

1805-07 State street, Hugh Watt, 300 Wabash ave.

741 Shober street, Harvy & Mose, 665 North ave.

705 Superior street, Harvy & Mose, 665 North ave.

Stewart ave. and Franlkin street, S. Dietscher, Milwaukee ave. north of Lawrence ave.

Selwyn and Willis streets, S. Dietscher, Milwaukee ave. north of Lawrence ave.

5928 Sangaman street, J. Gannon, 6212 S. Halsted street.

5608 Sherman street, J. Gannon, 6212 S. Halsted street.

481 Superior street, J. M. Muller, 3441 S. Halsted street.

School street and Herndon, P. McCabe, 1715 N. Ashland ave.

79th Place east of I. C. R. R., G. Larson, 272 57th street.

946 33d street, Morris Bros., 3442 S. Halsted street.

393 Troy street, Jno. Wilkie, 262 Ogden ave.

64th and McChesney streets, L. Herzog, 2230 Archer ave.

Tracy street, and R. I. R. R., J. H. Bradley, 8028 Vincennes ave.

34th street, west of Dearborn street, E. Hennessey, 3247 State street.

843 Vincennes ave., J. H. Bradley, 8028 Vincennes ave.

Vanhorn & Leavitt streets, Steiner & McFarlane, 981 W. 21st street.

1477 Washington ave., D. Jack, 882 W. Lake street.

4310 Wood street, Morris Bros., 3442 S. Halsted street.

3626 Wentworth ave., F. J. Kendrick, 3634 State street.

Wilcox ave. east of California ave., M. C. McDonald, 383 Ogden ave.

Winter street, south of Sixtieth street, J. Gannon, 6212 S. Halsted street.

637 Walnut street, C. Jurgens, 1274 W. Madison street,

4024-26 Wabash ave., J. Hardin, 4539 Cottage Grove ave.

Wabash ave. and 47th street, E. Hennessey, 3247 State street.

852 Wellington ave., P. McCabe, 1715 N. Ashland ave.

5636 Wabash ave., J. J. Evans, 4401 Dearborn street.

5127 Wabash ave., E. Hennessey, 3247 State street.

5720 Wright street, D. F. Dewar & Co., 6312 Wentworth ave.

Wharton ave., south of 63d street, G. Larson, 272 57th street.

7120 Yale street, Bletsch, 930 Sheffield ave.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Henry Sierks has designed for Heissler, Junge & Co. a 2-story bakery, 260x262, to be built on Hopkins street, near Stewart avenue. It will be equipped with electricity and steam; cost, $120,000. For Peter Olt the same architect has planned a 3-story and basement store and flat building, 32x48; to be built on Wabansia avenue, near Robey street; cost, $15,000. William H. Thomas has designed for the Lowther Hall Association, a masonic organization, a 5-story building, 72x108, to be built at the corner of Colorado and California avenues. It will be constructed of pressed brick and stone; will be heated by steam, and will be cut into stores, lodge-halls and banquet rooms; cost, $50,000. The same architect has planned for Maypole Bros. a 6-story building, 60x151, to be erected on Canal street, just south of Madison. It will be constructed of stone and terra cotta, and the interior will be equipped for manufacturing purposes, light, heat and power; cost, $60,000. Also for George A. Williams a 2-story and cellar flat building to be built at 224 Seminary avenue; cost, $6,000. Holabird & Roche are superintending the construction of an elegant 3-story residence for Bryan Lathrop on Bellevue place, near the Lake Shore drive, for which McKim, Mead & White prepared the plans. It will be 69x42, and will be constructed of brick, with elaborate hardwood interior; cost, $40,000. Julius Speyer has designed a 6-story hotel, 85x70, for P. W. Ryan, to be built on 55th street, near Cottage Grove avenue. It will be constructed of brownstone, with elaborate interior appointments; cost, $60,000. For John Doyle he has designed a 3-story store and flat building, 26x60, to be built on Van Buren street, near California avenue; buff stone construction; cost, $9,000. R. G. Pentecost has planned a 4-story and basement apartment house, 29x66, to

be built on Michigan avenue, near 42d street. It will be built of stone and brick, and will cost $20,000. Wilson & Marble have planned a 4-story and basement apartment house, 25x90, for J. B. Stone, to be built at the southeast corner of Paulina and Jackson streets. Pressed brick and stone construction; cost, $20,000. J. C. Brompton has planned a 3-story and basement flat building, 44x65, to be built at Ravenswood, by Sam Brown, Jr. It will be constructed of stone, pressed brick and terra cotta; cost, $18,000. For the same person he has planned a 2-story attic and basement residence, 38x54, to be built at Ravenswood. It will be of frame construction; cost, $10,000. Patton & Fisher have designed two 3-story store and flat buildings, 25x90, to be built at 357-363 Madison street, by Edward Hildreth. Pressed brick and terra cotta construction; cost, $30,000. For J. H. Howard they have planned a 3-story residence, 32x55, to be built at the southeast corner of 48th street and Kimbark avenue. Stone, tile and slate, with elaborate hardwood interior; cost, $15,000. For Arnold Heap they have planned a 3-story residence, to be built at 1423 Washington boulevard. It will be constructed of brownstone, with roof of slate and elaborate hardwood interior; cost, $7,000. They have also planned a frame chapel for Kenwood Evangelical Church at the corner of 65th street and Champlain avenue: cost, $2,500. For P. E. Wilson they have designed a 2-story and attic frame residence, to be built at Oak Park; cost, $6,500. For S. H. Little they have planned a frame residence, to be built at Birchwood Beach; cost, $4,000. For James W. Scoville they have planned a residence, to be built at Pasadena, Cal.; cost, $10,000. For the Universalist Congregation at Elgin, Ill., a brick church; cost, $15,000. For the Keeweenaw Club, at Houghton, Michigan, a frame club-house, 48x60, 3 stories and attic high; cost, $12,000. For the Phi Kappa Psi fraternity at Beloit, Wis., a 3-story frame club-house; cost, $6,000.——Philadelphia, Pa.: Architect Addison Hutton has invited estimates upon the drawings prepared for the new 3-story building to be erected at Elwyn Station by the Pennsylvania Institution for Feeble-Minded Children. The structure will cover an area 68x144, and will include a finished basement of considerable height. In the 1st ward John J. Cassidy will build 100 houses within the next few months. The first of these dwellings will be started at once. New bids have been invited upon the drawings prepared by Frank R. Watson, the architect, for the 9-story building to be erected at 728 Market street for A. Kirschbaum & Co. Angus S. Wade has been notified officially of the acceptance of his competitive drawings for the new Masonic Temple to be erected at Camden, N. J., at a cost of about $75,000. It is intended to erect a stone structure, five stories high, having a temple for masonic purposes at one end, and a theatre at the other. Work has been started upon the residence and stable to be erected at 3919 Chestnut street for Monroe Smith by Contractors J. E. & A. L. Pennock. The drawings were prepared by F. L. & W. L. Price. The house will be three stories high, with a facade of carved stone. The house will cover an area of 59x75, the stable measuring 43x42. E. F. Hipple will build 50 3-story dwelling-houses at 13th and Dauphin streets at once. They will be trimmed with carved red stone and finished throughout with hardwood. William T. B. Roberts will start work soon upon 1,200 dwelling houses. The site for this mammoth enterprise is bounded by Wolf, Ritner, 12th and 16th streets.——Cincinnati, Ohio: Architects Crapsey & Brown have designed the M. E. Church, Clifton, Ohio. Materials will be stone; seating capacity for church and Sunday school, 600. Also Elks' Hall to be located at Portsmouth, Ohio; cost, $20,000; size, 42x100 Materials will be stock brick, trimmed with stone. Also dwelling for D. L. Bishop, to be located on Kemper lane, Walnut Hills; cost, $4,000, and frame chapel for St. Paul English Lutheran Church, to be located at Cook and Addison streets, Camp Washington; cost, $3,000. Architect A. O. Elznner has designed for Sig. Rheimstrom a 2½-story pressed brick dwelling, to be located on Greenwood avenue Avondale. Also a 16-room pressed brick dwelling for Max Lowenstein, to be located on Fairfield avenue, East Walnut Hills, to cost between $15,000 and $20,000; stone trimmings. Architect G. W. Rapp has plans for a residence for Gustave Willus, to be two and a half stories, built of pressed brick, stone foundation and trimmings; cost, $12,000.——Washington, D. C.: The architects in the office of the Building Inspector are preparing plans for a woman's addition to the workhouse for which the last Congress appropriated $25,000. The addition will be of brick, three stories in height and 35x100.——Milwaukee, Wis.: Chicago architects have prepared plans for extensive additions to the Blatz Brewery plant. The estimated cost of the proposed improvements is $550,000. The first new building to be commenced will be the new bottling-house, ground for which will be broken on Monday next. On the half block between Johnson street, and Juneau avenue will be built a new brew-house, eight stories high with a 90-foot tower on top. A new 5-story ice house will be built at the corner of Broadway and Johnson streets. This building will be surmounted by a tower which will rise 130 feet above the street. Back of the brew-house will be erected a cooperage-house, 120x160. Mrs. N. Lonstorf is having a $25,000 residence built at the corner of Grand avenue and 23d street. The house will cover an area of 49x68 and will be three stories high. The architect of the building is W. A. Holbrook.

HEATING AND LIGHTING.

New electric light plants or extensions of existing systems are reported as probable in the following places: Ypsilanti, Mich., address Frank Tooker, of Bay City; Pensacola, Fla., address the Stratton Ice Works; Henderson, N. C., address the Henderson Light & Power Co.; Cordele, Ga.; Huntsville, Tex., address W. S. Gibbs or C. G. Barrett; Jonesboro, Ark.; West Bend, Wis.; Quakertown, Pa.; Manlius, N. Y.; Dallas, Tex., address the Mayor; Albion, Ia.; Carthage, Ill.; Muskegon, Mich.; Grand Haven, Mich.; Dillsburg, Pa.; Markdale, Ont.; Portland, Conn.; Cannelton, Ind.——Deposit, N. Y.: It is reported that $17,000 have been subscribed toward a plant.——Chattanooga, Tenn.: Guild & White will purchase a 750-light incandescent dynamo, 100 lamps of 50 c. p. and other supplies.——Kansas City, Mo.: The Merchants Electric Light Co. states that the subscriptions to the stock are being made in a satisfactory manner, and that a contract for the plant will be let soon.——The following Electric Light Companies have been recently organized: Edison Electric Light & Power Co., Fresno, Cal.; capital stock, $100,000; incorporators, J. M. Ryan, L. Gundelfinger, W. Fahey and others. Edison Electric Illuminating Co., Atlanta, Ga.; capital stock, $10,000; incorporators, J. F. Dickenson, W. H. Rhett, W. H. Inman. Gray Electric Co., Chicago, Ill.; capital stock, $50,000; incorporators, E. Gray, F. K. W. Cushing, L. O. McPherson. Columbian Electric Light, Heat, Power & Mfg. Co., Jersey City, N. J.; capital stock, $1,000,000; incorporators, J. Hirshfield and W. Wright, of New York, A. P. Morison, of Montclair. Lake Charles Ice, Light & Water Works Co., Lake Charles, La.; capital stock, $100,000; incorporators, J. A. Landredth and others. Chicago Equipment, Chicago, Ill.; capital stock, $1,000,000; incorporators, R. H. Pugh, R. Wilbeforce, H. S. Munroe. Marshall Electric Light & Power Co., Marshall, Ill.; capital stock, $10,000; incorporators, G. L. Cragg, F. A. Wunders, E. M. Arnold. Cœur d'Alene City Illuminating Co., Cœur d'Alene City, Idaho; capital stock, $20,000; incorporators, M. R. Killinger, D. Thiery, C. D. Barry and others. Edison General Electric Co., Boise City, Idaho; capital stock, $12,000,000; incorporators are all residents of New York, represented in Idaho by John Cunningham, of Boise City. Oklahama Water & Light Co., Chicago, Ill.; capital stock, $800,000; incorporators, Chas. Wood, H. S. Oakley, J. Gibson.

SEWERAGE NOTES.

Gardiner, Mass.: Plans and estimates are to be prepared by Mr. F. Danforth, of Gardiner.——Boston, Mass.: The city engineer has been authorized to expend $58,000 on the extension of the sewerage system to Squantum.——Nantucket, Mass.: A committee has been appointed to investigate the sewer question and engage an enquirer to prepare plans. Mr. J. S. Barney, C. E. Snow and W. F. Codd are on the committee.——Cobleskill, N. Y.: An engineer has been engaged to prepare plans.——Olean, N. Y.: Mr. J. A. Seymour, city engineer of Bradford, has made a proposition to prepare plans and estimates for the proposed system.——Florence, S. C.: A sewerage system is under consideration, and surveys are to be made. Address the mayor for particulars.——Birmingham, Ala.: The city engineer will prepare plans for the sewerage of the South Side.——Muncie, Ind.: A vitrified pipe sewer 8 to 16-inches diameter, with manholes, catch basins, flush

tanks, etc., is to be built on Jefferson street.——Ann Arbor, Mich.: A sewerage system is proposed.——Monmouth, Ill.: An ordinance has been passed providing for the construction of a system of sewers.——Roseburg, Ore.: A sewerage system is to be built. ——Portland, Ore.: Rudolph Hering's plans for sewerage for the East Side have been adopted.——North Yakima, Wash.: About $42,000 will be spent on a sewerage system.

WATER WORKS NOTES.

Everett, Pa.: C. G. Masters informs us that the Everett Water Co. expects to begin construction soon, No contracts have been let. Supply, spring, pumped to reservoir.——Hyndman, Pa.: The Hyndman Water Co. was incorporated August 19, with an authorized capital stock of $20,000, of which $100 was paid in. L. J. McGregor, secretary, informs us that the supply will be from a mountain spring, by gravity. Estimated cost, $30,000. Engineer in charge of surveys, J. J. Whetstone, Buffalo.——Moscow, Pa.: A water company has been organized, with J. T. Richards as president. Proposed supply, lake at Daleville, two miles from Moscow.——Towson, Md.: Works are again projected, and there is talk of incorporating the town at the next meeting of the legislature.——Cazenovia, N. Y.: C. W. Knight has reported on increased water supply. The people have passed a resolution to the effect that no permanent additional supply shall be obtained except by gravity. A cheap temporary pumping station will be erected, if necessary.——Gilbertville, N. Y.: It is reported that a citizen has offered to build a dam in or near the village to form a water works reservoir, provided the money necessary to lay mains be raised; estimated cost for latter, $3,000.——Jamestown, N. Y.: It is reported that the Board of Public Works is considering the matter of city water works. The present works were built in 1882 by a company.——Pine Plains, N. Y.: A canvass for water consumers is being made, and works may be built. Address S. J. Bowman.——Attleboro, Mass.: A preliminary report on a new source of supply, from the Bungay Valley, has been made by the special committee. The estimated cost is as follows: Well, $8,000; pumping station and shed, $5,500; suction pipe and connections, $2,000; land and pipe lines, $16,000.——Hanover, Mass.: It is reported that the Hanover Water Co. will soon begin to build works.——Fremont, O.: Plans for an additional supply are under consideration.——Willoughby, O.: The Improvement Association has been investigating possible sources of supply and has petitioned the Council to take steps toward works.——Front Royal, Va.: H. L. Cook, Baltimore, has been elected president, and C. A. Macatee, secretary, of the Royal Water Co. It is said that construction will be started at once.——Grafton, W. Va.: It is reported that bids for building works are wanted. J. J. Gilligan is Town Clerk.——Jackson, Mich.: The Water Committee has recommended that the well near the flowing well be completed, and that a receiving well 30 feet in diameter by 30 feet deep be sunk near the present pumping station; that a 24 inch vitrified pipe be laid from the first named wells to the receiving well, and that the wells at the pumping station be connected with receiving well; that certain existing mains should be replaced with larger ones; a force main should be laid to connect with an elevated reservoir or stand-pipe. Bonds to the amount of $100,000 must be voted upon by the people.——Flandreau, S. Dak.: The village wishes to sell about $10,000 of bonds to enable it to build works, or to grant a water and light franchise. Proposed supply, river pumping to tank or stand-pipe. Population, 750.——Crystal, N. Dak.: Fire protection works are talked of.——Oklahoma, Ok. T.: The Oklahoma Water & Light Co., of Chicago, has been incorporated by H. S. Oakley and J. Gibson; capital stock, $300,000. ——Pueblo, Col.: The mains will be extended to Lincoln Place, National Park and Capital Hill. Pipe has been ordered. The Z. V. Trine Investment Co., proposes to build works to supply Overton, a new oil town 6 miles north of Pueblo.——Baird, Tex.: The Baird Water & Power Co., has secured its charter and is receiving stock subscriptions.——Denton, Tex.: It is reported that a flow of water has been secured and works will be built.—— Gonzales, Tex.: City works are talked of. The present plant is owned by a company.——Huntsville, Tex.: There is talk of organizing a company to enlarge an ice factory and build water and electric lighting plants. Address W. S. Gibbs.——Long View, Tex.: We are informed that the town thinks of building works. W. H. Emerson has just completed a flowing well for an ice factory, and can give further information.——Stephenville, Tex.: Address W. C. Baldwin regarding proposed water and lighting plants.——Nashville, Mich.: Water works bonds to the amount of $20,000 have been issued.——Northville, Mich.: Works will be built either by the village or a company. The estimated cost is $30,000.——South Haven, Mich.: Works are projected.——Springfield, Ill.: D. C. Cregier, of Chicago, has reported in favor of a 24-inch main from the river to the reservoir; estimated cost $50,000.——DeWitt, Ia.: A well is being sunk and works are proposed.——Malvren, Ia.: Bonds to the amount of $7,000 have been voted for works.

BIDS AND CONTRACTS.

Huntsville, Ala.: Bids will be received by the Council until Sept. 20 for a 3,000,000 gallon pump and boiler to operate the same. Pump will work against head of 175 ft.——Sulphur Springs, Ill: The city will receive proposals for a water-works franchise until Sept. 15. Proposed supply, wells or reservoirs, pumping to stand-pipe; estimated cost, $30,000, to $35,000. Address O. M. Pati.——Mankato, Minn.: Bids are wanted until Sept. 7, for the construction of 4,000 feet of sewer extension. J. B. Swan is President of the Board of Public Works.——St. Louis, Mo.: Proposals are wanted until Sept. 11, for the construction of numerous sewers. Address Daniel Abel, President Board of Public Works. ——Metropolis, Ill: Proposals are invited until Sept. 10 for the construction of a system of water-works and electric lights.

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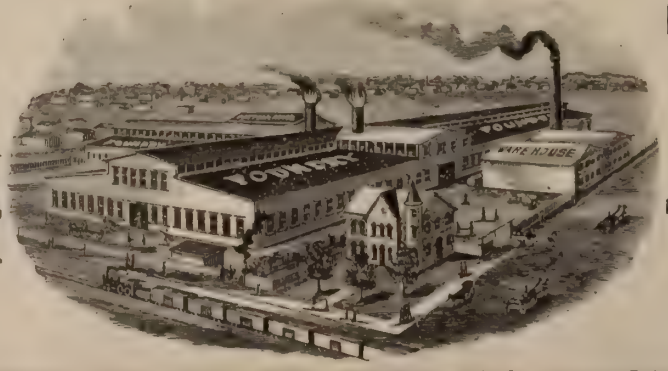

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THE SANITARY NEWS cares very little about having credit given it on articles copied from it, and, if there be any who wish to use its columns, we will take pleasure in sending them two copies, if they let us know. It is our aim to scatter the information furnished abroad, and we will aid others all we can. There may be some we do not now know of who would wish to use our columns in this way. If there be such, all they will have to do is to address us, and the papers will be sent. If such papers will send us marked copies, they will greatly oblige. We leave it to the conscience of all papers as to whether they give credit or not.

FOR the past week or ten days the East River, almost from the Battery to Harlem, has been covered with a thick scum of oil and refuse from the Standard Oil refineries at Hunter's Point. The odor is terrible, and to add to the misery of the poor people in the East Side tenements a disease of the eyes has broken out. The frequenters of the city baths along the East River for the past week or so have been forced to go over to the West Side or be laid up with sore eyes. Dr. Shrady said to-day that he would not be surprised to wake up some fine morning and find a terrible epidemic of fever raging in New York.

"Every avenue in the city is torn up," said he. "The stench from these gas and sewage-permeated holes is enough to bring a plague. But that is not all. There is that Standard Gas nuisance, the unclean streets, and now—last, but by no means least—this terrible enemy to our city's health, Hunter's Point, steps in. Humanity can stand a great deal, but really we are tempting fate. That scum on the water is enough to blind an army of bathers."

The Eye Hospital, at Twenty-third street and Third avenue, has had a great many cases of boys almost made blind in the baths. At Bellevue are many more cases, but what the doctors fear most is an outbreak of Typhus fever.

"This terrible state of affairs along the East river front impresses me greatly with the advisability of the action we have recently taken," said Jesse Seligman, of the Baron Hirsch fund. "Our plan is to rent a number of corner buildings in the thickly settled portions of the city, fit them up in good shape and make them attractive bathing places for the poor. Every bather would have a separate apartment. He or she will have the greatest privacy, and, above all, great cleanliness."

THERE is no use talking about doing work for what it is worth. The thing to do is to do it, and then you will be better provided for the future. There is no reason why you should make good excuses for not doing it. The thing to do is to do good work and let that speak for itself. It will tell more in a short space of time than you could in any amount of time you would take.

BE not stuck up in your work. Always try to help another when the time comes. It may not come but you will feel better when you are ready to help if it does come. One cannot help himself always, and at all times be ready for any work that may be placed upon him.

LOOK well to what you are doing. Don't begin to do that which will in the end injure you or at last knock off some of the profits. We continue to hear of cutting prices at a low tide. Don't do this; we do not like to hear of it and do not want to know that such is going on. It does not make us feel good, and it will not make you feel any better. You will keep at it till all will be gone some of these days as nothing can last against nothing.

GENTLEMEN get to work. Start now and make it tell. Let people know that you are in earnest and will tell in the exposition of sanitary appliances. This will be a large assortment, and well placed. It will be of the best manufacture, and will be the best of the kind ever placed on exhibition. Make arrangements to come and see them and bring all with you you can.

WHAT OF THE PLUMBING?

The time of year is approaching when the windows and doors of the house will be sealed. These points of ventilation will be carefully stopped with rubber strips, or something that will suffice

to keep out the life-giving oxygen. The rooms will be calcimined or papered, the furniture and carpets dusted, and everything fixed for the long winter months, in which no ventilation will be arranged. Added to this will be combustion by stoves, grates, furnaces, etc., and the gas in the rooms, rendering them obnoxious at best. The family will sit up in the evening working or enjoying themselves, and get up in the morning with headache, yawn and stretch, and never feel well until they get out and breathe some air that should have been breathed all night. Such people keep deluding themselves that they are working too hard, and that something in the way of a rest should be taken. It is only fresh air. It will do all the resting for such people and place them in a position to do more work than before.

This is so important that it is now time to look at the matter aright. When it is necessary to have a certain portion of air admitted into a room, it must be remembered that the temperature of that air has but little to do with the matter of ventilation. It has considerable to do with comfort, and for this reason some arrangements should be made so that the same amount of air would be admitted with the same degree of comfort. When the air is admitted through a furnace to the several apartments of the house, care should be taken to have this air pure, or as nearly pure as can be obtained. Often the inlet pipe is broken, and the air is taken up out of the basement where decaying vegetables send up their foul gases into the household, together with whatever substances may be placed in the basement. The same applies to the indirect means of heating. The direct methods, a radiator being placed in the house, no arrangements are made for ventilation at all. Steam or hot water heating generally arranges matters in this way, and no one can live in a room thus heated and have all the air needed for ventilation supplied. Some other means for this most important hygiene law should be prepared. If there are no other methods for ventilation arranged, the windows and doors must be used. It is well to have a window properly arranged, so that it will not be too near the stove or radiator, and supplied with a light board made to slant up at the top, so that the air entering will not touch any one till it becomes warmed. A draft is about as bad as no air at all, but neither need be indulged. Any one can arrange such matters by the use of a little common sense. It is easily seen how a room may be ventilated, without causing any injury to the household. The location of windows and doors can be seen in the rooms and the air admitted without injury to any one. The trouble with the matter is, it is not done.

While the above is to be most emphatically recommended, the question still remains, what is to be done with the plumbing? While all this calcimining, sweeping, dusting, and ventilating is being done, it is a good time to view the plumbing and see that it is all right or made so. It will usually be found that this is not only not done, but is not thought of at all. As a usual thing plumbing is put in a house and little heed is paid it afterward unless a very serious rupture discloses itself. People as a general rule do not go about the house looking after defective plumbing. They do not seem to think of it in any manner. They will clean the rooms, tack down the windows, put strips on the doors, but will leave the plumbing to take care of itself. This is not at all right. It is really the worst thing that can be done. There are many things that will put out of repair the best job of plumbing that can be placed in a building. Outside of everything connected directly with the plumbing is the settling of the house. The foundations in the greater parts of many of our cities are known to be of the quality that yield to the pressure placed upon them. The settlement of buildings will quickly disarrange the drainage pipes and the plumbing generally, and the intusion of gases from the sewers will be the result.

The manner in which this should be avoided is to have a reputable plumber examine the work, and, if found out of order, to repair it at once. Delay is dangerous in this matter. It is not to be permitted and health remain secure. It will take but little time and trouble to have this properly cared for, and it will be a much less cost than the doctor bills occasioned by defective plumbing.

Connecticut last year took out more patents in proportion to population than any other state in the Union.

NOTES AND NEWS.

A pound of phosphorus is sufficient to tip 1,000,000 matches.

It requires about 3,000 pounds of rose leaves to produce an ounce of atter of roses.

It is said that the first mill to be operated by water power was invented by Mithriadates, king of Cappadocia, about the year 70 B.C.

Asthma may be greatly relieved by soaking blotting or tissue paper in strong saltpeter water; try it, then burn it at night in the sleeping room.

The sun is so large that, although its distance from us is nearly 93,000,000 miles, yet only a little more than 100 suns laid in a row, touching one another, would reach the earth.

A German scientist has discovered a curious gaseous compound, made up of oxygen and hydrogen. It dissolves metals, and with silver and mercury it forms powerful explosives.

There are about 105 women to every 100 men; one-quarter of the population of the world die before the age of 17 years; only one in 1,000 lives to be 100 years old, and only six in 1,000 reach 75.

For paint to stick to zinc use the following wash:—Chloride of copper, 1 part; nitrate of copper, 1 part; sal ammoniac, 1 part; water, 64 parts. This coat is left for 24 hours before applying the paint.

Platinum and silver can each be drawn into wire many times finer than human hair. The former has been drawn into wires so fine that 27 of them could be twisted together into a hollow of a hair.

The longest continuous fibre known at the present time is that of silk. A cocoon of a well fed silk worm will often yield 1,000 yards long, and in one instance one has been produced which contained 1295 yards without a break.

Artificial grindstones, made of a mixture of pulverized quartz, powdered flint, powdered emery or corundum, and rubber dissolved by a suitable solvent, are now made for sharpening tools which outwear by years any natural stone known.

So called diamond ink for writing on glass is a compound of fluoric acid and barium; the latter has no effect, it being simply a white powder to give body to the acid. The ink can be used with a rubber hand stamp, and it should be allowed to remain fifteen minutes, when the barium will brush off, leaving the design on the glass.

The Aerial machine which Mr. H. Maxim is having constructed at Crayford is nearly completed. It will be propelled through the air by a light screw making 2,500 revolutions per minute, and, according to the inventor, will be capable of transporting through the air about 30,000 pounds of freightage.—*The European Mail*, London.

It is known that wasps' nests often take fire, supposed to be caused by the chemical action of the wax upon the paper material of the nest itself. May this not account for many mysterious fires in barns and out-buildings.

A new Swedish glass is claimed to have important advantages for microscope and other fine lenses, giving greatly increased power. The chief improvement over other fine glass consists in the addition of phosphate and chlorine, which impart absolute transparency, great hardness, and susceptibility of the finest polish.

For users of steam power, who are not skilled mechanics or not accustomed to run engines, a unique type of engine construction has, says the *Safety Valve*, lately come into vogue, consisting of a moving steam cylinder and moving valve, and a stationary steam chest, thus dispensing entirely with various mechanical arrangements, commonly employed, such as the eccentric valve rod, complicated connecting rods, slides, rockers, etc.

A luminous outburst of the sun was observed by the French astronomers on the 17th of June. First appeared a luminous spot of a yellow golden tinge, soon followed by another just above it. The spectroscope showed the first spot to consist of a central eruption, from which volcanic bombs were thrown to heights above the chromosphere, where they seemed to rest as dazzling balls. A few minutes later these were replaced by brilliant jets or filaments.

VENTILATION AND HEATING.*

BY W. G. BLISH.

The first, the last and the continual demand of life is air, and no one disputes the fact that, for the best health and the power of resisting disease, the air must be pure. It is estimated that fifty per cent of all fatal diseases are the result, directly or indirectly, of breathing impure air. Yet, important as it is, there is perhaps no subject of any human interest to which less attention is paid in a practical way than to our air supply.

At every instant of our lives, waste matters, matters that are dead and for further use are obnoxious to animal life, are presented at the lungs for removal. At each respiration of pure air oxygen is absorbed and these effete matters are taken up and thrown off with the air expired. Perspiration also adds to the sum of these noxious products in the air about us. The use of ventilation is to remove these and other deleterious matters from our presence and to keep us supplied with the oxygen necessary to their continued removal, and sufficient to make life possible and perfect.

The present condition of this room affords a striking lesson on the use and necessity of ventilation. Let us reflect on what the condition must be. As there is no provision for ventilating, the room must contain largely the same air that it did when we first came in. Here are nearly 400 of us who have been breathing this air over and over for two hours, just passing it back and forth from one to another, each one helping to deprive it of its oxygen, and returning in its stead the products of respiration and perspiration. There are also over sixty gas jets which have been consuming oxygen and generating carbonic acid equal to perhaps 200 persons more. In addition, the air is full of dust, raised by the commotion of so many coming in. Among the many things this dust contains are filth from the street, with any germs it may contain, and the sputa of consumption, sore throats, catarrh and other contagious diseases. Not directly detrimental, perhaps, but no more pleasing to contemplate, are the effluvia of decayed teeth, of catarrh, of perspiration, of gases from disordered stomachs, of the breath of tobacco chewers and smokers.

If for no other consideration, we should ventilate for decency's sake, for I do not overestimate the matter in the least when I say that it is quite as nasty to breathe these things, only that we do not see them, as it would be to drink the water of our bath. But what must be the result of breathing this air from a danger point of view? If the air taken into the lungs does not contain its normal amount of oxygen the waste products are not properly prepared for elimination, and even if prepared and presented at the lungs, if the air is already saturated with such impurities, which is true as far as respiration is concerned when it contains only a very small percentage of them, like a sponge that is full it can not take up more. The lungs also have no power of selection but must assimilate whatever is presented to them. The result is then that as we sit here our blood is not receiving its full quota of oxygen, the waste matters are imperfectly eliminated, and the same matters that have been once expelled, which are carbonic acid, and organic matters largely in a state of decomposition, are inhaled to be in part reabsorbed. Hence our systems are rapidly becoming loaded with virulent poisons, poisons that depress the vital powers, undermine the health and lay the foundation for permanent ill health and disease.

The condition in this room is that in our churches and school rooms when occupied, and is only an exaggeration of the state of things in our homes. But in our homes we add to the danger by carefully closing every opening and by covering our walls, which are naturally porous, with paper and paste. The paper is often decked with poisonous colors and the paste decays and makes a habitat for disease germs. We also pollute the air within by poorly managed heating, by bad and dirty lamps, by decaying vegetables, by improperly cared for wastes of the kitchen, by foul basements, by leaks from gas fixtures and imperfect plumbing.

With the evils just named the ounce of prevention is worth the pound of cure, but as we cannot wholly prevent them the remedy is ventilation. We believe theoretically in ventilation, but in practice we build our houses as if fresh air next to cold is the greatest thing to be avoided. The only objection ever offered to ventilation is the cost; yet the amount of fuel required to warm the air we need, sufficiently, is really small and costs less than many things of much less importance which we do not do without. We economize in matters of true health and comfort and waste where there are no returns. We build our houses air-tight and scrimp in buying apparatus for warming, and then waste enough by poorly devised apparatus and bad firing to have given us good ventilation. We defy nature by living in a vitiated atmosphere, and pay more than we have saved to the doctor and the druggist, vainly endeavoring to be made whole.

I would not convey the idea that ventilation is a simple problem that everybody can solve without some study or forethought. It is influenced by so many things as the arrangement of rooms and openings, conditions of wind, weather, etc., that no system can be made automatic, or that does not require attention. It should be a part of the study of every architect, and to obtain the best results must be provided for in his work. The question for the masses is how to avoid as much as possible the need for care which is sure to lead to neglect. In moderate weather we can use the doors and windows but in cold weather we have to avoid cold and dangerous drafts.

The ordinary grate is perhaps the most popular method of ventilating. With a proper provision for the supply of pure air it is certainly very efficient. The air of a room also does not become over heated as is liable with other methods of warming, and being cool it contains more oxygen to the cubic foot, hence is more invigorating and pleasant to breathe. The grate has its drawbacks though. As usually arranged it subjects us to cold currents which flow along from the cold windows and doors, strike us in the back and play around our feet. It is also extremely wasteful of fuel, dirty, requires frequent attention, heats the room unequally and is quite liable, particularly when only a slow fire is required, to leave smoke and gases in the room.

The hot-air furnace affords good ventilation when properly managed. I need not say anything further of its advantages, which are well known, bnt will only speak of its drawbacks which, generally, are not so well considered. In the usual construction the heating surface is too small for economy and is liable to become overheated, and the circulation is cramped by small flues, still further reducing the economy, and largely spoiling the air for breathing. Hot-air furnaces are rather uneconomical at best, because air is slow to take up heat or to give it out. Warming a room by the heating of the air is all wrong, too, in principle. The main use of the air is for breathing and it is not desirable to habitually breathe air much above a moderate temperature. Warm, rarefied air is very debilitating, causes headaches and makes us feel bad and uncomfortable every way. Dr. William A. Hammond says it makes us cross, disagreeable and even vicious. Passing over highly heated surfaces air also becomes over-dried, parched as it were, making it harsh to the mucous surfaces of the throat and nostrils. Supplying moisture improves it, but this is nearly always neglected. The danger of bronchial and pulmonary troubles is also increased by going suddenly and often from a room into which the air is flowing at a temperatuue of 100 degrees and upward, out into an atmosphere of freezing or zero weather. Such sudden and severe changes cannot be safely made by everybody.

It is very important to have the air cool for breathing. You all agree with me that the cool air of winter braces and invigorates while the warm air of summer depresses and enervates. Carbonic acid is eliminated more freely in a cool than in a warm atmosphere, the brain is clearer and the secretory organs are rendered more active. Many cannot understand how we can have cool air in a warm room or keep warm in a room that contains cool air; but you can all understand that air is warmed slowly and only as each particle of it comes in actual contact with warm bodies. Hence with a continual admission of cool air the air of a room can easily be kept at a lower temperature than the room itself. Cold air also offers no obstruction to the passage of heat, so that a hot stove, or any warm body sends out its heat to us with the same facility through a body of cool air as through warm air and without even warming the air. In fact this is the way we get most of our warmth from the outside, by the radiation of the objects about us. Some will object that passing cool air through

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a room must carry off a large amount of heat; but it requires a certain amount of air to ventilate in any case, and there should be an actual saving if the air is disposed of, or leaves the room, at a low temperature. The cost for fuel is owing not so much to the air we use as to the radiation to and taken up by the cold windows and walls of the room.

The true way then to warm our rooms is by direct radiation, warming the air as it enters just sufficiently to take off the chill and prevent cold drafts. If you will use the hot-air system always select a heater larger than the maker says you need. Then put in large supply pipes and not try to warm large rooms with small pipes as is often done. Small flues obstruct the circulation and hold the heat back at the furnace, while large quantities of air moderately warmed is more economical and is more pleasant than a small amount highly heated. Don't attempt to use the plan adopted by a few makers who wish to save you fuel and hence your good will at the expense of your health; that is to return the air from the room to the heater to be used over and over. It is well enough to do this in warming up an empty room, as a church or a hall, before assembling; but before the audience arrives, fresh out door air should be turned on, for the room will be foul enough at best in a short time. In rooms with few occupants it might do to return a portion of the air if it were practical to do so; but it would introduce a complication and confliction of currents that would be troublesome to manage. The only safe way is to use nothing but the pure air from the outside, even carefully excluding all air of basements. The cold air pipe should be of larger capacity than all the warm air pipes combined so that they will all be fully supplied. If they are not some pipes will rob others, counter-currents will take place and the effort of the pipes to fill will suck the smoke, dust and gases from the joints of the heater and convey them to your rooms.

The smoke flue and chimney should also be large and not obstructed with dampers in such a way that the products of combustion will be forced into your rooms instead of going up the chimney. Small chimneys are also more easily overheated and so become cracked, and then, if forced beyond their capacity, are very prolific of fires. Thousands have learned this, from bitter experience, yet, inconsistent as it seems, they continue to build chimneys the same way. The fire should also be regulated as much as possible with the front drafts instead of by dampers in the pipe. Such dampers are sure to be misused. It is said of them that they save heat. But we put in a fire-place with a large, open chimney that carries the greater part of the heat out and think nothing of the loss, while with a stove or furnace we go to the other extreme and blacken our walls and pollute the air we breathe. We can sometimes see the results of such practice as it often happens that people are smothered by coal gas leaking from their stove. This is a good place to speak also of the pernicious practice of using gasoline and gas stoves in closed rooms. A case was recently reported where husband and wife were both asphyxiated by a gasoline stove. The oxygen is rapidly consumed, carbonic acid is generated in large quantities, and carbonic oxide is sometimes formed in small quantities. It is said of the latter that one breath of the pure gas will knock one down as quickly and as surely as a club.

The great majority of people depend on stoves for warming, and for economy and simplicity of management it is one of the most desirable methods of heating. But with the stove alone and no provision made for ventilation, if carpenters succeeded in making our rooms air-tight, as they attempt to do and as we try to have them do, we could smother to our heart's content. The best method of introducing fresh air in stove-heated rooms is perhaps to run a pipe from out of doors to underneath the stove and with a sheet iron or metal casting compel the air to flow against the stove as it enters. Or a flue could be run up in the partition back of the stove, opening out at the top of the room. This would let in the cold air where the currrent rising from the stove would help to spread and diffuse it about our head. Another plan is to lower an upper sash a trifle and adjust a thin board in such a way as to deflect the current upward so that it will not drop directly down upon us. Whatever method is used the upper portion of the room should not be a great deal hotter than the lower portion. It is no uncommon thing to find a difference of twenty or more degrees, more often in rooms warmed in hot air. The heated air rises at once to the top and a lake of cold air is found at the bottom, reversing the injunction to "keep the head cool and the feet warm." An aid to equable warming is to place the heater on the cold side of the room. With a stove or grate so placed we need not always when sitting by it in cold weather burn our face and at the same time freeze our back.

(Concluded next week.)

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

In the business and manufacturing portions of this city there are continually improvements going on. These improvements may be seen every day, and they are observed by every one. The four-story building is being remodeled, and in a short time a six, eight or ten-story building is found standing in its place. On almost any street this improvement is seen going on, and in these taller buildings we find the work required for them being performed by the boilers designed for the four-story building. This simply argues that, these boilers being worked beyond the capacity of safety, are not only dangerous to life, but the result is imperfect combustion, or smoke. It is well known that boilers are made to perform certain work. They are graded to this work, and when a larger amount is put upon them they are always at the top of their service and are continually being pressed upon the danger lines. When the boiler, constructed to perform the work necessary for a four-story building, is made to perform the work required for an eight or ten-story building, it will be found inadequate to discharge the greater duty in a perfect manner. We believe the city authorities should see that every boiler performs no greater service than that for which it was originally intended, but we will probably have to wait till some great calamity overtakes us in this regard. It will be in the near future when a boiler will explode in some of our buildings and scatter death and destruction broadcast. It will then be time for those who should prevent such a sacrifice, to comment on the overworked boiler, and probably they will take some action regarding the matter.

In this connection it will not be amiss to mention the boilers set in an out-of-the-way place and cared for but little as boilers should be cared for. They can be found so placed in many of our buildings in the heart of our city—stuck away as near out of sight as possible. There is want of air and the combustion cannot be made perfect enough to stop the smoke. In each of these two places, no smoke preventer ever made will accomplish the work needed. It has no chance to operate. In the first place it cannot make the over-worked boiler peform the work required of it safely and well; in the next place it cannot get the required amount of air to enable it or anything else to perform the work. Consequently we have smoke.

It cannot be considered amiss to consider the fusible plug that is inserted in many of our boilers. This is a piece of block tin prepared in the boiler so that it will melt out at the proper time, and thus prevent an explosion. These will serve their purpose for a short time, but is there not altogether too much dependence placed in them? Will not the scale which gathers in boilers gather also over these plugs and prevent them from performing the service for which they were intended? It seems to us that this will necessarily become the case with them, and then, in time, an explosion will occur. In short, are they not adapted more to prevent that care and caution which every engineer should give his boiler, rather than prevent accidents? However this may be these plugs are not intended to prevent smoke, and canuot be relied on in this particular. To prevent smoke is the main purpose, and it cannot be done with boilers situated as the above. They must be doing the work for which they are intended, and be so situated that enough fresh air can be got to them to perform perfect combustion.

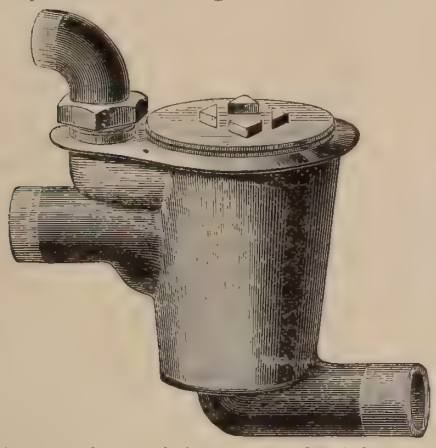
We do not claim that the proper officer is not willing to prevent smoke or abate the nuisance now upon us. That it is not done is no fault, perhaps of his, but that he has not the proper support, not the proper backing, and the proper public encouragement, are surely the facts in his case. But from whatever source, this lack of attention is responsible, it is surely one deeply to be complained of. The smoke is not abated as it should be,

and it requires not more than a glance to acquaint one of this fact. On almost any street in the city evidence of the smoke is continually seen. One need not climb high towers to view it. Down in the street it is easily to be viewed and almost everywhere it can be seen.

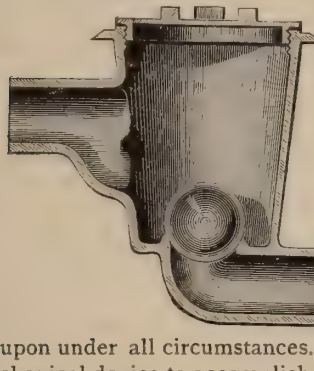
We have before mentioned some of the reasons why the smoke is not abated. There are others which might be given, but we suppose they are clearly known by those whose duty it is to see that the nuisance is abated. It is one of the old time toys—just playing with the smoke and telling it to go on injuring property and health, and the devices ready to abate or prevent it at hand. They are not difficult to find. They are being thrust upon the administration with a liberal hand, but the question is, how are they going to be brought into use? Until this is done it is little good they will do. The short of it all is an energetic work toward the end in view. Let one prosecution follow another so rapidly that the producers of smoke will not have time to draw their breaths, and they will soon begin to look about for the best means of preventing the smoke. When this is done, the greater part of the work will be ended; and the smoke will soon disappear.

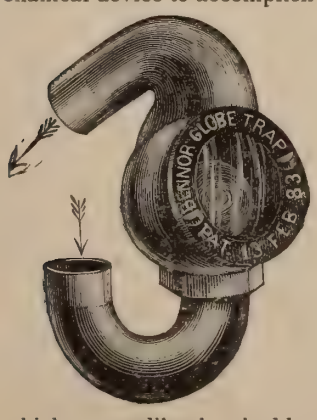
THE BENNOR SYPHON TRAP.

We are glad to avail ourselves of the opportunity kindly offered in your letter to bring before the readers of your valuable paper the merits of the Bennor Syphon Trap, which we have been manufacturing for a number of years, and of which we ask no better indorsement than the largely increased sales.



A back air vent will not prevent the water seal of an ordinary or non-mechanical trap from being destroyed by syphonage, evaporation or capillary attraction. Mr. Kelly, in his article in your issue of January 24th, claims to have found several instances, where the water seal was destroyed by capillary attraction. Just how this may have occurred, we do not understand, but the point of importance in considering the matter, is the fact that simply a water seal, even when the back air vent is properly used, is liable to be destroyed; and, therefore, something else must be substituted, which can be depended upon under all circumstances. This brings us at once to a mechanical device to accomplish the purpose, and what can be more simple than a ball, which must of its own weight, surely find the seat on which it will make an air-tight seal, and prevent any back air from the sewer passing into the room through the fixture, even if the water seal be broken.





It is also claimed by many that the evaporation from the inner surface of a water seal which is exposed to the air of the room, is dangerous so long as there is no mechanical contrivance to keep this portion of the water pure and free from the poisonous gasses which are readily absorbed by the water which comes in contact with the gasses of waste pipe. The rubber ball on the metal seat accomplishes this by separating the water on the side of the trap exposed to the room through the outlet of the fixture, from the water on the sewer side of the trap, which must absorb the gasses from the sewer.

We claim that a back air pipe is by no means necessary when the Bennor traps are used; as the ball makes a perfectly safe and tight seal, and is not dependent upon the trap being filled with water, although from the construction of both the bath and the basin trap, complete syphonage is almost an imposibility, and under the severest test, the Bennor trap has never been syphoned to a sufficient extent to break the water seal. If the back air vent is omitted, and the waste pipe is of the same size, or even a little smaller than the outlet of the fixture, the syphonage will be sufficient to make the rubber ball, which is especially weighed for the purpose, clear the body of the trap—the syphonage giving it the rotary motion, which can be readily seen in the traps with glass section.

We send herewith a sectional cut of the Bennor Bath Trap, also a cut of the Bennor Globe Trap with glass section, showing the ball. Very respectfully,

HAINES, JONES & CADBURY CO.,
WM. Y. WARNER, Sec'y.

THE WATER COMPANY AND THE PLUMBERS.

The following facts are found in Memphis, Tennessee:

The Artesian Water Company has issued an edict that no hydrant shall be located where the water running from it can pass through a sink. Such a rule strikes the average citizen as ridiculous and arbitrary, but it exists and the plumbers are obeying it because they are required by the water company to give bond to conform to all of its rules.

In one instance, however, the rule has been violated and the chances are that there will be violations.

A Memphis lawyer is having his house remodeled, and it was deemed advisable to change the location of the kitchen sink. The plumber who was employed to make the change put the sink where he was directed, but would not put a hydrant over it, saying it was against the rules of the water company.

The owner of the house insisted that the hydrant be placed directly above the sink, telling the plumber that if he didn't another workman would be employed.

"There isn't a plumber in town who would do it," replied the artisan. "He would lose his license if he did."

"Why so? Is there an ordinance against it?" demanded the property owner.

"No, but the water company has a rule against it, and we are under bond to abide by the company's rules."

"I'll have that hydrant over that sink if I have to import a plumber to do the work," said the lawyer, "and if the water company attempt to turn off my water the chancery court shall decide whether it can or not.

The plumber said he would report the matter to the company, and if permitted would place the hydrant where it was wanted. He did so, and the secretary of the company wrote to the lawyer, inclosing a copy of the rule, and expressing a hope that the lawyer would not insist on having the hydrant over the sink. The lawyer did insist and President Latham, of the water company, decided to permit the plumber to violate the rule just that one time. He said, however, that he would not yield except for the fact that the sink had been located under the hydrant before.

In the event, however, that some citizen who knows his rights and has the nerve to go to the law to get them, builds a house and insists on having his hydrant over his sink, the water company will probably yield again.

Lawyers state that the water company has no more right to dictate where a householder shall locate his sink or hydrant than

it has to force him to use a certain kind of whitewash on his back fence, or to decide what sort of soup he shall have for dinner.

Of course, the company's purpose in making this arbitrary rule is to restrict the quantity of water used, and it has no right to do this. It may run the water through a meter if it desires and charge for the quantity used, but right there it's powers in that direction end. Its assumption of power, however, is unlimited. A case in point occurred not long ago. A resident of the seventh ward has a hydrant in his yard, near a gate, that is usually kept open. An attache of the water company called at the house and stated that he understood that other persons than those living in the house used the hydrant, and that the gate must be kept closed or he would shut off the water. He was advised that if he did so a lawsuit would result. The water was not shut off, and the gate still stands open.

In the majority of cases, however, the will of the water company is law with its patrons, and the rules extended to restrict the use of water are generally observed. It is expected, however, that some stiff-necked citizen will make trouble about the new rule prohibiting plumbers from connecting hydrants with sinks.

CONVENIENT TO HAVE ABOUT.

Dr. E. Lawrie reports two cases of chyluria, due to the presence of filaria in the blood, cured by thymol given in doses of one grain, gradually increased to five grains, every four hours.

A mixture of one part each of lactic acid and salicylic acid in eight parts of collodion, is recommended as an excellent application to warts or corns, effecting their removal in a short time.

Dr. Lennox Wainwright writes to the *British Medical Journal* that he has found menthol of great service in hay fever. It acts best when placed in an ordinary smelling-bottle mixed with carbonate of ammonia, and used as smelling-salts. Patients say all irritability disappears, and in many cases they get no return of the symptoms.

Dr. F. W. Langdon, of Cincinnati (*Lancet-Clinic*), calls attention to the value of benzine as a solvent of oily secretions in the preparation of skin areas for antiseptic operations. An agent that can penetrate and disinfect the pores and follicles of the region to be operated upon, has advantages not possessed by any of the watery solutions in common use.

To check the secretion of milk, the application of a solution of camphor, one part, in oil of turpentine, six parts, has been recommended. Care must be taken to prevent injury to the skin, for such a mixture would irritate strongly if kept long in contact with the inadequate under an impermeable dressing.

Dr. C. T. Meacher suggests a five per cent. solution of carbolic acid in water, as a safe and reliable local anæsthetic in dentistry. Four or five drops should be injected under the gum on each side of the tooth to be extracted. He says in most cases this is effective, and where inflammation exists around the root the action is most satisfactory. Dr. Meacher thinks that with moderate care there need be no fear of constitutional symptoms arising, considering the small quantity used. A French dentist, who uses carbolic acid for this purpose, believes that it is equally as efficacious as, and less dangerous than, cocaine.

A correspondent from Durango says, that formerly about one-half of the children in the city, died from the sting of the scorpion, but now nearly all the lives are saved, if taken in time, by the use of a strong tincture of aconite, of which five or six drops are put in a tumbler half full of water, and a teaspoonful given at frequent intervals.—*Medical Times.*

The *Medical Press* is responsible for the statement that a curious application has been made of the absorbable properties of lanolin in the treatment of wrinkles. When well rubbed in lanolin passes directly into the skin and acts as a nutriment to the subjacent tissues, with the effect of smoothing out the folds produced by the attenuating of these structures incidental to age. Several elderly ladies who were induced to give this method of treatment a trial, are said to have been delighted with the result.

Scraping or burning off old paint is hardly expeditious enough for general purposes, and is also laborious. Soda and quicklime are far more thorough, and the paint is more quickly removed. The solution of half soda and half quicklime is thus made: The soda is dissolved in water, the lime is then added, and the solution is applied with a brush to the old paint. A few moments are sufficient to remove the coats of paint, which may be washed off with hot water. Many preparations are sold for the removal of paint, all of them having some basis of alkali. A paste of potash and strong lime is far more effectual in operation, and the oldest paint can be removed by it. Afterward a coating of vinegar or acid should be used, to cleanse the surface before repainting. For removing varnish, spirits of ammonia is used, but it is a slow process, and several applications are necessary. Scraping ands and-papering can be employed, but it must be done carefully by experienced hands, or the surface of wood will be injured.

EXAMINATION QUESTIONS.

The following questions were proposed in the examinations of the City and Guilds of London Institutes for plumbing:

1. Where the supply of water to a valve closet is restricted by the water company, describe briefly, and show by rough sketches, the kind of water waste-preventer you would recommend; state the size of the pipe you would fix to supply the waste-preventer from a cistern fixed about 15 feet or 20 feet above it, and the size of the service-pipe you would fix between the waste-preventer and the closet-basin.

2. Understanding a tack for a lead soil-pipe to be a piece of lead about 9 inches by 9 inches, or 10 inches by 9 inches, and an ear or lug to be a thick piece of lead cast or cut to shape, about 2 inches by 2 inches, to match, it may be, the ear of a neighboring cast-iron rain-water pipe, how many tacks would you solder to a stack of soil-pipe 50 feet high, for securing it to a brick wall, and how many wall hooks would you fix to each tack; or, if ears were insisted on, how many ears would you solder to the 50-feet length of piping? Show by rough sketches how you would solder the tack and ear respectively to the soil-pipe and state which of the two methods you would prefer to adopt for securing the pipe to the wall, and give reasons.

3. It is required to fix a stack of soil-pipe in a chase in the internal face of an external wall of a four-storyed-house, with a branch from a closet on each of three floors, the closet on the ground floor being of the pedestal wash-down kind, with an earthenware trap; that on the first floor being a valve-closet, with a lead trap; and the one on the third floor being a wash-down basin, with a lead trap under it, and a table-top for receiving slops. Describe briefly, and show by rough sketches, how you would treat the whole of the plumbers' work, the cistern for supplying the water being fixed on the fourth floor, directly over the closets, with no restriction as to the supply.

4. What are the properties of lead, and from what ore is lead chiefly obtained? Briefly describe the best process you know of for extracting lead from the ore, and running it into pigs, and how pigs are converted into sheets and pipes respectively.

5. How would you secure lead hips to roofs that are nearly vertical, with wings or sides on the slates, 6 inches wide, so that the lead may be retained permanently in its position, and what should be the maximum length of the pieces of lead you would fix for the purpose?

6. A range of four flushing-rim valve-closets is to be supplied from a cistern, 15 inches deep, fixed directly over, with its bottom 4 feet above the top of the closet, and one general service-pipe is to be fixed from the cistern with a branch to each closet. State the sizes of (*a*) the general service-pipe, (*b*) the branches, and (*c*) the supply-valve to each closet.

7. How would you fix the apron flushing, cover a torus roll and finish off the edge of a lead flat on the top of a high-pitched slated roof? Give sections.

8. Apart from increasing the durability of cast-iron drain-ventilation-pipe by galvanizing it, what advantages are gained by protecting such a pipe from rust, and what important points should be borne in mind in selecting the positions for the outlet of ventilation-pipes of soil-pipes and drains?

9. Mention the important features of the best kind of wash-out closet with which you are acquainted, and describe and give sketches showing how you would connect it to a lead soil-pipe. What objections on sanitary grounds are there to the adoption of this kind of closet?

10. State the proportions of lead and tin for making (*a*) fine

solder for copper-bit work, and (*b*) plumbers' solder for wiping purposes. What are the melting-points of each kind of solder and of lead and tin respectively?

11. Two valve-closets, one on the first floor and the other on the second floor of a house, each with a 4-inch round pipe-trap under it, are connected by 4-inch branches to a stack of 4-inch soil-pipe carried up full bore to the roof for ventilation. What would be the effect upon the seals of the closet-traps and the overflow-traps of the closet-basins by the discharge of pailfuls of slops through the upper closet, and if any evil arose how would you remedy it?

HONORS GRADE.

1. Are traps of any value for keeping noxious gases out of a house, and on what principles should they be made for valve-closets, sinks, baths and lavatories? Give rough sketches of the various traps for plumbers' work with which you are acquainted, and state their advantages and disadvantages.

2. Describe the essential features of a good valve-closet, and compare the best kind of modern valve-closet with the old Bramah closet, and state the best method of supplying a flushing-rim valve-closet.

3. In the case of a four-storyed house, where the soil-drain runs from the back to the front, and there is no space or area outside the external walls, the whole of the site being occupied by the building, how would you disconnect the drain from the sewer, and how would you treat a rain-water pipe to be carried down the center part of the house, and a waste-pipe from a range of three lavatory basins situated on the first floor in the centre part of the house? Give rough sketches.

4. Why does soft water act more on lead than hard water? In which case would the action of pure water on lead be more likely to render it unfit for potable purposes, when the lead cistern and its service-pipes are kept fully charged with the water, or when they are only occasionally charged? And where the water could not be drawn from the water company's main, of what material would you recommend the cisterns to be made for storing water for drinking purposes, and where should the cisterns be placed?

5. In certain cases of sewerage disposal, where it would not be advisable to allow the grease from the scullery and kitchen sinks to be sent into the drains by a flushing arrangement, describe and give sketches showing how you would arrange for the interception of the grease, and state the advantages and disadvantages of intercepting grease from the house-drain.

6. Explain how cistern and other filters can become contaminated and be the cause of greater evils than those they are intended to prevent. Describe the best filter with which you are acquainted and how you would arrange for a supply of filtered water on the first floor of a house and in the butler's pantry.

7. Describe briefly and roughly sketch a lead-burning machine, and mention a few cases where it is essential that the edges of the leads or their laps should be burned instead of soldered, and describe the operation of burning.

8. What objections would you have, if any, to supply a draw-off cock with water for potable purposes from a cistern which also supplies by a separate service-pipe a valve-closet with a supply-valve and regulator attached to the closet? Would you prefer drawing drinking-water direct from the communication-pipe (rising-main) from the water company's main without constant supply or from a cistern. Give reasons.

9. There is a small stream of soft water suitable for potable purposes about a mile distant from a house which is occupied only three times a year and for about six week on each occasion. The stream is at a sufficient height to allow the water to gravitate from it to the house, but the supply which could be taken from it daily would be equal to about 500 gallons only, which is about half the quantity needed when the house is in full occupation; and about midway between the stream and the house there is a depression in the ground of about 20 feet, which the water-main would have to follow. How would you arrange for a proper supply of water to the house at all times during its occupation, what kind of pipe would you use for conveying the water, and what should be its size, and how would you treat the main at the depression in the ground? Give sketches.

10. It is proposed to lay a stoneware drain, about 150 feet in length, outside the external walls of a house that is occupied by about twenty persons, to receive the discharges from three stacks of waste-pipes from sinks, baths and lavatories, one stack of waste-pipe from two slop-sinks into which three stacks of soil-pipe discharge, and the rain-water and surface-water from a superficial area of about 3,000 feet. Briefly describe and give rough sketches showing how you would disconnect the drain from the sewer; give a transverse section through the drain, and state its size, and say how the joints should be made.

11. Two wood cisterns, each 3 feet 5 inches by 3 feet 4 inches and 3 feet deep inside, are to be lined in position with lead — that for the sides weighing 6 lbs. to the superficial foot and that for the bottom 7 lbs. to the superficial foot — and to be supplied by a ¾-inch rising-main, with a ¾-inch Croydon ball-valve, with a pressure on it of about 15 lbs. to the square inch. State the sizes and numbers of the pieces of lead necessary to line the two cisterns, and the length of sheets, 7 feet wide, you would require from which you would cut the sides and bottoms respectively. Describe how you would line the cisterns, state the total length of soldered angles in the two cisterns, and give sections of the horizontal and verticle angles, showing the soldering and the edges of the lead. Describe how you would connect the two cisterns together, and provide against an overflow of water in the case of the ball-valve getting out of order. Give rough sketches showing the relative positions of the connecting-pipe, the overflow-pipe and the ball-valve.

ST. LOUIS MEETINGS.

Our Association held its semi-monthly meeting on last Tuesday evening. President Gallagher in the chair, and with a good attendance.

The new firm of Cradock Bros., No. 3227 Franklin avenue, was admitted to membership. This makes the membership 136.

The Picnic Committee made its final report and was highly complimented for the manner in which they entertained all present on that day.

We were honored this week by a letter from our National President, expressing regret at not being able to attend our excursion.

Resolutions of sympathy were extended to brother members— Jeremiah Sheehan, Wm. F. Lambe and Cornelius Collins — who, so lately, were afflicted with deaths in their families.

Business here is very good — all the members seemingly rushed.

Your correspondent visited the St. Louis Exposition last evening and failed to see an exhibit of plumbing goods.

I believe, if some of our plumbers would look into this matter, it would result with profit to themselves and instruction and information to our patrons. The necessity of good sanitary plumbing, aided, of course, by fixtures that are an ornament to any house, cannot be too fully impressed on the minds of our people.

MOUND CITY.

PLUMBING NOTES.

In compliance with the resolution of the Board of Health directing that Master-Plumber Frank Hodges' name be stricken from the list of registered plumbers, Philadelphia, Pa., he has surrendered his certificate of registry to Chief Hughes, inspector of house drainage.

The contract for plumbing and hot water heating in Paul Haven's Broadway residence has been let to Bransfield & Co., says the Leavenworth *Times*.

The following reports were received, Philadelphia, Pa.: The report of the Lazaretto physician showed that 150 vessels had been visited and 3,819 passengers examined. There is but one patient in the hospital. The report of the Nuisance Department showed that 271 complaints had been examined and 254 nuisances found. Chief Inspector of House Drainage Hughes made 771 inspections during the month and inspected 8,040 new buildings.

To show a joke made by the papers and copied about, we take this one from *Harper's Bazar*:

"That plumber I employed is a fool."

"Why?"

"I told him I wanted running water in my bedroom, and he

put it there, but with nothing to shut it off. Said that wasn't specified."

Experience has amply justified the employment of women as an auxiliary force in the often delicate and arduous work of factory inspection. The ladies engaged in this service for the state have gone about it with bravery, skill and energy. They have evinced no little detective genius. They have won the confidence of women operatives and have thus discovered and remedied abuses which could not otherwise have been found out. * * * The purpose of their visitations is to see that children and women are not worked over hours and that employers observe the regulations prescribed by law to secure proper ventilation and sanitation, the provisions of fire escapes, the safe construction of elevators and other equally commendable ends. Armed with the great powers of the state, they have toiled during these hot months among the toilers, have penetrated and renovated many "sweater" dens, have taken workers of tender years from their servitude and sent them to school, have warned and enlightened surly, ignorant and brutal employers, and where warnings were not enough have caused their arrest and punishment.—*New York Telegram.*

Special officers and plumbers were at the residence of Albert Still, No. 825 Inquirer street, Philadelphia, Pa., yesterday, searching the drain-pipes for the body of a baby which Still admits having thrown there. He claimed that it was still-born. Magistrate O'Brien would not accept that statement, and held him in $1,000 bail for a further hearing.

The discovery was brought about through a clogged drain-pipe. When the plumbers opened a section of it they found a number of rags and other matter which led them to believe that either a child or a part of one had been forced into the pipe. Still said that he had thrown the child, which was the off-spring of a young colored woman, into the cess-pool last January. The police are looking for the mother.

AMONG THE MANUFACTURERS.

Smith & Webster of 193 Lake street, those energetic hustlers for trade, report business good. They are contemplating improvements in their business that we will note in the future. Among their visitors during the past week was Mr. W. T. McGurrin of the firm of Sproul & McGurrin of Grand Rapids, Mich., also Owen Hanratty, an old time Chicago plumber now doing business in Springfield, Ill.

We called on Col. J. B. Clow. Outside of the Colonel's proportions there is nothing small about the Colonel or their trade. The Colonel uses an elegant black stove-pipe hat for a cuspidor at his desk. He had among his visitors during the past week James Madden, Vice-President of the National Association Master Plumbers, Indiana. He reports business rushing at Fort Wayne. While Volney S. Cooper of Princeton, Ill., was laying in supplies for a large public school in his vicinity.

Johnny Martin of the firm of Henry Huber & Co., was favored with a visit from one of the members of his firm during the past week in the person of A. C. Tiedeman, who made a flying visit to Chicago to see the World's Fair city.

William Hattersley of A. Hattersley & Son of Fort Wayne, Ind., is in the city. He reports business good in his vicinity.

Mr. Verity at Wolff's show room is kept on the jump showing the latest improvements of the Wolff Co. in fine goods. He was visited during the week by the Ferguson Bros., three brothers and three plumbers of Dubuque, Iowa. Also E. Napier of Michigan City and Benton Harbor, who were in the city adding to their store of knowledge and goods of this well-known firm's make. Owen Hanratty of Springfield also paid him a visit.

Mr. Griffin of the Stewart Ceramic Co. reports an increased inquiry for their elegant line of laundry tubs, sinks, etc., and anticipates a splendid trade this fall and winter.

The J. L. Mott Co. reports trade as vastly improved during the past few weeks. Their magnificent show room and the character of their goods on exhibition is well worthy a visit.

Gleason & Bailey report a vast improvement in business in their line.

Thos. Kelly Bros. report a largely increased sale of their goods since their new departure. Their inventive skill merits the success attained by their goods. It is a pleasure to do business with them.

We visited Peck Bros., Labor Day. They are fitting up their new show room, having already in position a splendid display of their famous lavatories. Our old friend Oliver is as cheerful and as good natured as ever. They report splendid business.

HEALTH IN MICHIGAN, AUGUST, 1891.

For the month of August, 1891, compared with the preceding month, the reports indicate that typho-malarial fever, typhoid fever, dysentery and cholera infantum increased, and that puerperal fever, membranous croup, pleuritis, measles, influenza, inflammation of brain, diphtheria, erysipelas and cerebro-spinal menimgitis decreased in prevalence.

Compared with the preceding month the velocity of the wind was less, the prevailing direction was the same (west), the rainfall was considerably more, the temperature was higher, the absolute and relative humidity were more, the day ozone and the night ozone were less.

Compared with the average for the month of August in the five years, 1886-90, scarlet fever was more prevalent, and smallpox, membranous croup, puerperal fever, erysipelas, typho-malarial fever, inflammation of brain, pneumonia and cerebro-spinal meningitis were less prevalent in August, 1891.

For the month of August, 1891, compared with the average of corresponding months in the five years, 1886-90, the velocity of the wind was greater, the prevailing direction was west (instead of southwest), the temperature was higher, the rainfall was much greater, the absolute humidity and the relative humidity were slightly less, the day ozone was less and the night ozone was slightly more.

Including reports by regular observers and others, *diphtheria* was reported in the month of August, 1891, at *sixty-two* places, *scarlet fever* at *seventy-nine* places; *typhoid fever* at *fifty-eight* places and *measles* at *twenty-two* places.

Reports from all sources show *diphtheria* reported at *four* places less; *scarlet fever* at *three* places less; *typhoid fever* at *five* places less and *measles* at *thirty* places less in the month of August, 1891, than in the preceding month.

Henry B. Baker,
Lansing, Michigan, Sept. 3, 1891. Secretary.

FOR THE DIGESTION.

Mrs. Gray—"Mrs. Giddiun is applying for a divorce." Mrs. Keene—"Indeed! I didn't know she was stage-struck."—*Indianapolis Journal.*

Fashion Note—There is nothing like "having a pull." Pull the ballet dress down far enough and you have the ball dress.—*Minneapolis Journal.*

There is a fortune for the milliner who shall devise a bonnet that can be worn in any part of a church and always present the trimmed side to the congregation.—*Texas Siftings.*

"Yes," said the editor, as the mad subscriber shot him down, "we said that we were 'here to stay,' and this proves it. Ring up the coffin factory!"—*Atlanta Constitution.*

Maudie—"Good gracious! I think there is a man following close behind us!" Jennie—"Well, don't walk so fast, dear. He never can catch up with us."—*New York Telegram.*

Waiter—"What kind of soup will you have?" Beenthere—"Just plain." Waiter—"What do you mean by that?" Beenthere—"Without any thumb in it."—*Boston Courier.*

Smythe—"I hear that Simpkins has just got a pension. He never saw any service, did he?" Tompkins—"No; but he lost his voice urging his neighbors to go to the front."—*New York Sun.*

Ethel (fishing for a compliment)—"I wonder what he saw in me to fall in love with." Clarissa—"That's what everybody says. But men are curious creatures, dear."—*New York Press.*

St. Peter—"Who are you?" Applicant—"An humble Texas rainmaker." St. Peter—"Um! You'd better apply one story below. They've been complaining of drought there ever since the country was settled."—*New York Herald.*

Watts—"I believe there is something in the theory of people being disinclined to marry those of similar character." Potts—"Why, sure! You never find a grass window wasting her time on an ideal man of straw, do you?"—*Indianapolis Journal.*

Biggs—"What do you think of this Dr. Bolivar's nerve medicine that's advertised so much?" Gibbs—"It's a good thing. Why, I know a man in the clothing business in this city who commenced to use it a month ago, and now he's advertising 'Men's all wool suits for $6.' "—*Smith, Gray & Co.'s Monthly.*

Eaten out of house and home—picnic lunches.—*Boston News.*

The forger is always careful to get a good name.—*Binghamton Republican.*

Attack points heavenward when it means the most mischief. It has many human imitators.—*Texas Siftings.*

Caller—"Is Mrs. Brownston at home!" Servant—"Yes'm. She'll be at home all the evenin', It's my night out."—*New York Weekly.*

Figgs—"Closefist left his property so that his widow could not marry again." Diggs—"How was that?" Figgs—"He left it all to his son."—*New York Herald.*

Dick (at seaside hotel)—"Where is Harry? We can't go without Harry." Tom—"He is up in his room writing to his father." Dick—"Then never mind him; he must be broke."—*Puck.*

"There is nothing new under the sun," remarked Solomon. "O, yes, there is," said the milliner's collector, as he came up with the bill, "and your wife is wearing it."—*Washington Star.*

"Hello, is this the brewery?" shouted the tough young man over the telephone. "No," came the answer. "Brown's undertaking shop." "O, excuse me, I'll see you later."—*Buffalo Enquirer.*

College President—"All the boys have attended prayers regularly this week." Professor—"Not one has missed for two weeks." President—"Humph! Some infernal mischief is brewing."—*Good News.*

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

3100 Armour ave., J. H. Roche, 210 31st street.

Ashland ave., N. of Superior, A. Lauder, 902 W. Madison.

Ashland and W. Chicago aves., A. Lauder, 902 W. Madison.

2251 Archer ave., J. Teutsch, 2961 Wentworth ave,

Atlantic ave., S. of 52d street, M. Stack, 723 Root street.

5016-18 Aberdeen street, M. Stack, 723 Root street.

6752 Bishop street, J. Bain, 6338 Justine ave.

Commercial ave., S. of 92d street, Tully Bros., Houston ave. and 92d street.

1173 Central Park ave., J. Mills, 122 W. Lake street.

849 Chicago ave., Gay & Culloton, 62 N. Clark street.

4035 Dearborn street, J. Amst, 4016 Wabash ave.

Division street and Western ave., A. Lauder, 902 W. Madison street.

595 18th street, C. Uher, 524 W. Eighteenth street.

307 and 244 Erie street, Nelson & Cederholm, 67 W. Ohio street.

556 Englewood ave., Sherman & Bennett, 2515 S. Halsted street.

3224 and 4459 Emerald ave., J. Teutsch, 2961 Wentworth ave

Fairfield, N. of Chicago ave., D. W. Burns, 29 43d street.

Fifteenth street E. of Paulina, Dornbos Bros. 573 W. Eighteenth street.

240 Forest ave., Garner & Bahn, 1740 Milwaukee ave.

54th Pl. and Wharten ave., T. B. Bryson, 6335 Wentworth ave.

934 50th street, A. Miller, 4300 Wentworth ave.

50th Ct. W. of Peoria street, W. Johnston, 652 65th street.

4100 42d street, A. Miller, 4300 Wentworth ave.

3631-35 Forest ave., Wm. Bowden, 238 25th street.

42nd street nr School, F. Murphy, 6810 S. Halsted street.

7109 Greenwood ave., F. Murphy, 6810 S. Halsted street.

Hoffman ave., N. of Franklin street, Garner & Bahn, 1740 Milwaukee ave.

3408 Halsted street, J. J. McMullen, 3441 S. Halsted street.

2954 Haines court, C. Kostlevy, 218 W. Eighteenth street.

339 Hastings street, O. Heyman, 300 Washburn ave.

1425 Harvard street, J. Liebold, 311 W. Twelfth street.

5125 Jesline street, A. Miller, 4300 Wentworth ave.

919 James ave., J. P. O'Brien, 293 W. Indiana street.

Kedzie ave. and Twelfth street, S. Smith, 469 California ave.

851 Kedzie ave., M. C. McDonald, 383 Ogden ave.

Lull ave. and Wood street, Molter & Kretchner, 426 E. Division street.

38 and 40 Lexington ave., M. C. McDonald, 383 Ogden ave.

Logan street W. of Wallace, J. C. Arnst, 4016 Wabash ave.

407 Lincoln street, Nelson & Cederholm, 87 W. Ohio street.

3117 Laurel ave., J. J. Byrne, 2810 Archer ave.

Lyons street near Evans ave., George Pfeiffer, Kensington ave.

545 Monroe street, Watson & Davidson, 301 Wabash ave.

6614 Michigan ave., L. Clark, 345 63d street.

1236 Montana street, J. W. Brown, 364 Lincoln ave.

305 Myrtle street, Garner & Bahn, 1740 Milwaukee ave.

Newton and Division streets, J. Walsh, 3613 Ellis ave.

90th street and Erie ave., Tully Bros., Houston ave. and 92d street.

Noble and Ingram streets, G. Hausline & Son, 1197 N. Halsted street.

838 Polk street, J. Welch, 292 Blue Island ave.

481 Paulina street, A. Lauder, 902 W. Madison.

274 Paulina street, Nelson & Cederholm, 87 W. Ohio street.

5006 Paulina street, A. Miller, 4300 Wentworth ave.

3362 Prairie ave., William Bowden, 238 25th street.

3140 Parnell ave., Nash & Harna, 2216 Wabash ave.

2833 Portland ave., J. Teutsch, 2961 Wentworth ave.

444 Robey street, A. Lauder, 902 W. Madison street.

730-32 and 768 Rockwell street, Nelson & Cederholm, 87 W. Ohio street.

1449 Roscoe street, H. Bauer, 232 E. North ave

725 Root street; M. Stack, 723 Root street.

Surf street W. of Waban street, Robt. Griffith, 427 N. Clark street.

820 Spaulding ave., Dornbos Bros., 573 W. Eighteenth street.

544 Sedgwick, E. Breyer 72 W. Randolph.

State and Jackson streets, J. T. Martin, 215 22d street.

819 60th street, W. Johnston, 652 65th street.

School, E. of Clark street, A. J. Baer, 1710 N. Clark street.

5520 Sherman street, Wm. Bowden, 238 25th street.

112 Strong street, C. Kostlevy, 218 W. Eighteenth street.

139 Sholto street, C. Kostlevy, 218 W. Eighteenth street.

12 State street, Gay & Culloton, 62 N. Clark street.

71st street, nr Champlain ave., J. Wittich, 76th street E. of S. Chicago ave.

1040 68th street, M. Stack, 723 Root street.

Sangamon and 61st streets, F. Murphy, 6810 S. Halsted street.

Stony Island ave. and 68th street, F. Murphy, 6810 S. Halsted street.

Taylor street, nr Sacramento ave., S. Smith. 469 California ave.

35th street and Lowe ave., J. J. Curtin, 4929 S. Ashland ave.

21st street and Western ave., C. Kostlevy, 218 W. Eighteenth street.

Tracy ave. and Rock Island tracks, J. H. Bradley, 8028 Vincennes ave.

Throop and 69th street, D. F. Dewar & Co., 6312 Wentworth ave.

21st street and Homan ave., Binder, Barrett & Binder, 49 Franklin street.

31st and Armour ave., P. H. Roche, 210 31st street.

6002 Throop street, M. Stack, 723 Root street.

609 31st street, J. R. Alcock, 101 22d street,

32 Utica street, J. Leibold, 311 W. Twelfth street.

Utica, nr. Laurel street, C. Kostlevy, 218 W. Eighteenth street.

Union ave., S. of 79th street, F. Murphy, 6810 S. Halsted street.

Wells & Illinois streets, Robt. Griffith, 427 N. Clark street.

6828 Winter street, Wm. Johnston, 652 65th street.

646 Walnut street, A. A. Campbell, 842 W. Madison Street.

81 Wilson street, J. Liebold, 311 W. Twelfth street.

275 Webster ave., Gay & Culloton, 62 N. Clark street.

435 Winchester ave., J. Wilkie, 262 Ogden ave.

2971 Wentworth ave., J. Teutsch, 2961 Wentworth ave.

3654 Wentworth ave., J. R. Alcock, 101 22d street.

Yale street, S. of 70th, Lyon & Lee, 6215 Wentworth ave.

6430 Yale street, D. Dewar & Co., 6312 Wentworth ave.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: L. G. Hallberg has plans under way for an 8-story office building, 120x165, at the southwest corner of Wabash avenue and Harmon court, for the Ludington estate, of which Charles J. Barnes is the trustee. It will be constructed of steel and stone, and will be thoroughly fireproof and equipped with passenger and freight elevators; cost, $250,000. Mrs. Agnes Benton Barnes, with whom a number of Chicago and Eastern capitalists are associated, has leased the 1st Regiment Armory property on Jackson street, between Michigan and Wabash avenues, and will erect on it a 12-story theater and office building, for which several Chicago architects have submitted plans. It will cost $600,000. W. L. B. Jenney and W. B. Murdie have completed plans for a 2-story residence, 25x76, for Edwin J. Mortyns, to be built at 114 Astor street; cost, $20,000. T. N. Bell has planned a 3-story flat building, 26x67, for Mrs. M. F. Boyer, to be erected at 4514 Champlain avenue; cost, $5,500. For W. H. Hopkins, at Aurora, he has designed a 4-story and basement store, hall and office building, 120x44, to be constructed of cut stone; cost, $20,000. For the Christian Church, at Columbia, Mo., he has designed a new edifice to be of stone. It will be 67x105; cost, $17,000. For Mrs. J. T. Utley, at Sterling, Ill., he has designed a 2-story and attic frame house, 28x50; cost, $3,500. Alfred Smith has planned a 3-story flat building, 25x68, for Miss E. Lamb, to be built at 428 Marshfield avenue; cost, $10,000. For Alfred Johnston he has planned a frame residence, to be built at Austin; cost, $5,000. Robert S. Smith has designed a 3-story flat building, 25x68, for C. B. Mulhern, to be built on Wabash avenue, near Sixty-first street; stone construction; cost, $8,000. For Col. Waterhouse the same architect has planned a 2-story flat building, 27x77, to be built at 205 Warren avenue; cost, $9,000. Charles Thisslew has designed a 3-story and basement store and flat building, 25x100, to be built on Van Buren street, near Lincoln, by M. Clerkin; cost, $14,000. Also for M. Winholt he has planned a 3-story store and flat building, 30x70, to be built on Washtenaw avenue. Pressed brick and stone; cost, $10,000. For M. Jansen he has planned a 3-story and basement store and flat building, to be built at 46 Wesson street. W. G. Ruehl has planned a 3-story and basement store and flat building, 25x85, to be built at the corner of Western avenue and Potomac street by F. Hoepfner; cost, $12,000. He has also planned for P. C. Cook a 3-story and basement flat building, to be constructed of stone; cost, $8,000. For James Doyle he has planned a 3-story and basement flat building, to be built on Paulina street, near Taylor. Mrs. Munchord will build a 3-story and basement flat building on Congress street, near Aberdeen, after plans by the same architect; cost, $8,000. For M. Doher he has planned a 3-story and basement store and flat building, to be built on Halsted near Forty-second street; cost, $8,000. For Mrs. Dalton, on West Madison street, near West Forty-second, he has planned a 2-story and basement flat building; cost, $8,000.——Philadelphia, Pa.: Eugene Underhill will build a 2-story addition, 25x96, to the Young Men's Christian Association at the Northwest corner of Broad and Federal streets. The new structure will be fitted up as a gymnasium. Architects Hazelhurst & Huckel are preparing the plans for the temple to be built at the Southeast corner of Broad and Cherry streets. Bids will soon be invited upon the plans prepared for the new armory to be erected at Broad and Huntingdon streets. At the Southeast corner of Thirteenth and Huntingdon streets E. P. Hipple will soon erect fifty 3-story dwellings. The fronts will be of pressed Philadelphia bricks, with carved brownstone trimmings. On Lawrence street, between Lehigh avenue and Somerset street, a 5-story factory will be erected for Horner Bros., the carpet manufacturers. The structure will cover an area of 100x500. It will be massive in construction, and strictly fireproof.——New York City, N. Y.: Boring, Tilton & Mellen are architects for a handsome residence to be built at Mount Morris avenue and One-Hundred and Twenty first street, for A. G. Hupfel. The house will be four stories and basement of stone, 90x35. The cost will be about $100,000. George F. Johnson will alter the three 5-story flats on the northeast corner of Seventh avenue and One-Hundred and Twenty-seventh street in to a 7-story apartment hotel, at a cost of about $20,000. Hugo Kafka has designed for Ernest Molwitz a 5-story tenement, 25x65, on the southside of West One-Hundred and Forty-fourth street, 100 feet west of Eighth avenue. Charles Rentz has plans for a 5-story flat house at 266 Henry street, for Moritz Solomon. J. C. Burne has plans for five 5-story brick and brownstone flats, 25x27x90, to be built by William J. Mathews on the Northside of Eighty-eighth street, 36.8 feet east of Madison avenue, at a cost of $125,000.——St. Louis, Mo.: A 5-story brick hotel will be erected by Mr. Geo. Lauerbrum; cost, $160,000. Northwest corner of 22d street and Lucas place, 2-story brick conservatory of music, 44x75; cost, $13,000; owners, Epstein & Waldauer; contractors, Beinke & Wees. Northwest corner of Lucas place and 14th street, 2-story brick theatre, 90x155; cost, $30,000; owner, German Dramatic Association, contractor, A. J. Wilhelmi.——Cincinnati, Ohio: Bofinger & Hopkins have planned a residence to be erected at 5th and Vine streets for C. B. Melish, to cost $12,000.——Pittsburg, Pa.: A new residence is to be constructed in the East End, on Highland avenue, near Stanton; it is to be erected by Oswald Werner, at a cost of $25,000, and will pe of stone. The Chautauqua Ice Company will soon begin the erection of a 7 or 8-story addition to their already large building on Pike street, and changes will be made in the present structure. The addition and improvements will cost in the neighborhood of $125,000. Robert C. Elliott will erect a house at the corner of Highland avenue and McCully street, at a cost of $15,000. Architects Scott & Peoples are preparing plans for a row of seven dwellings; estimated cost, $16,000. Architect J. P. Brennan has prepared plans for a convent to be erected at McKeesport, Pa. It will be of brick, 2-story and mansard, tin roof, and will contain about 26 rooms; cost, about $35,000.——Buffalo, N. Y.: W. H. Archer, 17 Morgan Building, has prepared plans for the following buildings: St. Columbus Rectory, corner of Eagle and Hickory streets, Buffalo, N. Y., brick and stone with slate and tin roof. galvanized and wood cornice, three stories and basement, 62x31.6, inside finish, oak staircase and reception hall, the remainder of the house white wood natural finish, large dining halls, mantels, bath-rom lavatory and toilet apparatus, lift pantries wine cellar, gymnasium, and all modern improvements, heated with hot water and special improvements in ventilating arrangements, speaking tubes, stained and plate glass, etc. District school No. 3, Tonawanda, N. Y., brick annex with tin roof and 24 sanitary water-closets, arranged to accommodate 800 pupils, with steam heat, brick ventilating stack, automatic flushing, concrete floor, urinal, etc. H. K. Higgins new hotel, Tonawanda, N. Y., a frame building 40x80, comprising three stories and basement with accommodations for forty guests, also an office, bar, billiard, dining and reception rooms, with kitchen and pantries in the rear, chambers, lavatories, bath-rooms and toilet apparatus on the first, second and third floors, main and back staircase, plate and other glass, tin roof, copper bath, porcelain water-closets, commodious cellar and heating apparatus.

HEATING AND LIGHTING.

Electric Light.—New electric light plants or extension of existing stations are reported as probable in the following places: Nashville, Tenn., address the Citizens' Rapid Transit Co.; Seymour, Ind., address W. H. Shields; New Castle, Pa., address the New Castle Electric Light Co.; Cordele, Ga., address E. J. Williams; Brenham, Tex., address W. W. F. Boyle; Franklin, Ky., address M. S. Harris.——Braintree, Mass.: At a recent town meeting, the act of the Legislature to establish their own system of electric lighting was accepted by a vote of 149 to 3. The committee appointed at the last town meeting to investigate the different systems reported in favor of the arc system, and recommended the establishment of a plant at a cost of $20,000, running 100 arc lights, at a cost of about $50 each per year.——Yorksville, S. C.: A. M. Grist (care *Enquirer*) will buy an incandescent plant of 30 lamps capacity.——Alton, Ill.: The directors of the Alton Gas & Electric Co. have increased its capital stock from $40,000 to $60,000, and have decided on improvements costing about $15,000.——The following electric light companies have been recently incorporated: New Companies.—Newman Light & Power Co., Newman, Ga.; capital stock, $15,000; incorporators, W. L. Dresser, of Albany, N. Y., W. S. Whitham, of Anniston,

Ala., and others. Waterloo Electric Light & Power Co., East St. Louis, Ill.; capital stock, $10,000; incorporators, W. Wurdack, R. M. Hammon, M. A. Waters. Circleville Light & Power Co., Circleville, O.; capital stock, $100,000. Wright & Starr Electric Co., Philadelphia, Pa.; capital stock, $250,000; incorporators, B. F. Morley, of Chester; E. E. Wright, of Philadelphia, and others. Red Oak Electric Co., Red Oak, Ia.; capital stock, $25,000; incorporator, W. H. Blood, of Kansas City.

SEWERAGE NOTES.

Palmer, Mass.: Mr. J. J. Van-Valkenberg has recommended the separate system with filtration.——Glen Falls, N. Y.: A report on the proposed sewerage system has been made by Mr. S. E. Babcock. The cost is estimated at $167,665.——Birmingham, Ala.: An engineer will be engaged to prepare plans and specifications for a complete system for the city, including the town of Highlands.——Detroit, Mich.: An enabling act passed by the last Legislature permits the city to raise $1,000,000 by bonds for constructing sewers; but provides that only $500,000 shall be raised at one time, and this only upon a vote of the people at a charter election. A vote is to be taken shortly.——San Francisco, Cal.: A sewerage system for the southern district of the city is proposed. It is recommended that the city should adopt a plan for a complete system, and build the part for each district in accordance with that plan.

WATER WORKS NOTES.

Dryden, N. H.: Surveys for a water-works system are being made by L. O. Howe.——Union, N. Y.: The Union Water Co. has been organized by S. H. Morgan, Fred C. Reynolds, A. A. Morgan, and others. Capital stock, $25,000.——Danville, N. Y.: It is proposed to establish a system of water-works for domestic supply, or to grant a franchise for such a system.——Bridgewater, Mass.: The question of additional water supply is being agitated.——Kingston, Mass.: At a town meeting J. L. Hall and P. W. Maglathlin were appointed a committee to make investigations as to the available sources for an additional supply. Jones river is considered a probable source.——Wytheville, Va.: The Town Council has purchased Venricles spring, on Lick mountain, 3 miles from the city, A reservoir is being built near the spring, from which a pipe will be laid to the town reservoir.——Fairmont, W. Va.: The mayor and engineer have been visiting the Wheeling water-works, to obtain points in regard to the proposed works for Fairmont.——Cleveland, Tenn.: The contractors for the new works are said to be Sturtevant Bros. Information can be obtained from J. H. Hardwick.——Mayfield, Ky.: Water-works are to be established. The supply will be obtained from wells.——Franklin, Ky.: The new works will be built next spring, according to report.—— Saginaw, Mich.: A supplemental report on the water-works on both sides of the river is being made by Mr. J. D. Cook, of Toledo, O.——Jackson, Mich.: The vote on the issue of bonds for $100,000 for water-works will be taken Sept. 14.——Lake Charles, La.: Plant for water-works is wanted by J. A. Landry & Co., including pumps of 500,000 gallons daily capacity, standpipe about 16x125 feet, and 6, 8 and 10-inch cast-iron pipe.——Brookfield, Mo.: The vote on the proposition to issue bonds for $25,000 for water-works resulted in a majority of 603 in favor of the proposition.——Norwalk, O.: The Council has employed Mr. C. A. Judson, City Engineer of Sandusky, to make plans and estimates for the proposed water-works.——Monroe, La.: It is proposed to levy a tax for a system of water-works.——Belle Fourche, So. Dak.——It is reported that a system of water-works is to be established.——St. Joseph, Mich.: A vote will be taken on a proposition to issue bonds for water-works.——Kansas City, Mo.: A board of examining engineers is investigating the water-works with a view to the design and location of an entirely new plant.——Dallas, Tex.: The city will invite proposals for a pumping engine of 10,000,000 gallons capacity.——South Bend, Wash.: The South Bend Water Co. has been incorporated by E. H. K. Owen, E. Shepard and A. V. Boullion with a capital stock of $100,000.——Montesano, Wash.: Bonds to the amount of $18,000 will be issued for a new water supply. Address H. R. Bellamy.——Los Gatos, Cal.: The Mountain Spring Water Co. has been incorporated by Roscoe Bear, R. P. Grader and T. E. Beckwith. Capital stock, $100,000.——Sacramento, Cal.: The question of obtaining a better water supply is being considered.——Los Angeles, Cal.: The proposition to put in a new water-works plant at a cost of $250,000 is to be considered.

BIDS AND CONTRACTS.

Battle Creek, Mich.: Sealed proposals will be received until Sept. 26 for the materials and construction of a sewerage system. W. W. Brigden is city engineer.——Huntsville, Ala.: Proposals are wanted until Sept. 20, for the erection of a compound, condensing duplex pump. Address the City Clerk.——Brookville, Ind.: Proposals are wanted until Sept. 17, for the construction of a system of water-works. Address W. E. Schoonover, Town Clerk, as above.——Atlanta, Ga.: Proposals are wanted until September 16, for furnishing 600 feet 48-inch iron pipe and four ⅛ bends, 28,000 feet 30-inch pipe, cross trees, etc., 7,500 feet 20-inch pipe, cross trees, etc., Address G. W. Terry, Secretary of the water-works, as above.——Grafton, W. Va.: Proposals are wanted until Oct. 1, for the construction of a system of water-works. Address Mayor George W. Chambers, as above.——Muskegon, Mich.: Proposals are wanted until September 14, for the erection of a county court-house. Address Tate Starke, County Clerk, as above.

THROUGH VESTIBULED AND COLONIST SLEEPER BETWEEN CHICAGO AND TACOMA, WASH., AND PORTLAND, ORE.

The Wisconsin Central and Northern Pacific lines run through Pullman Vestibuled and Colonist Sleepers between Chicago and Tacoma, Wash., and Portland, Oregon. The train known as the "Pacific Express" leaves the Grand Central Passenger Station, at the corner of Fifth avenue and Harrison street, at 10:45 P. M. daily. For tickets, berths in Pullman or Colonist Sleeper, etc., apply to Geo. K. Thompson, City Passenger and Ticket Agent, 205 Clark street, or to F. J. Eddy, Depot Ticket Agent, Grand Central Passenger Station, corner Fifth avenue and Harrison street, Chicago, Ill.

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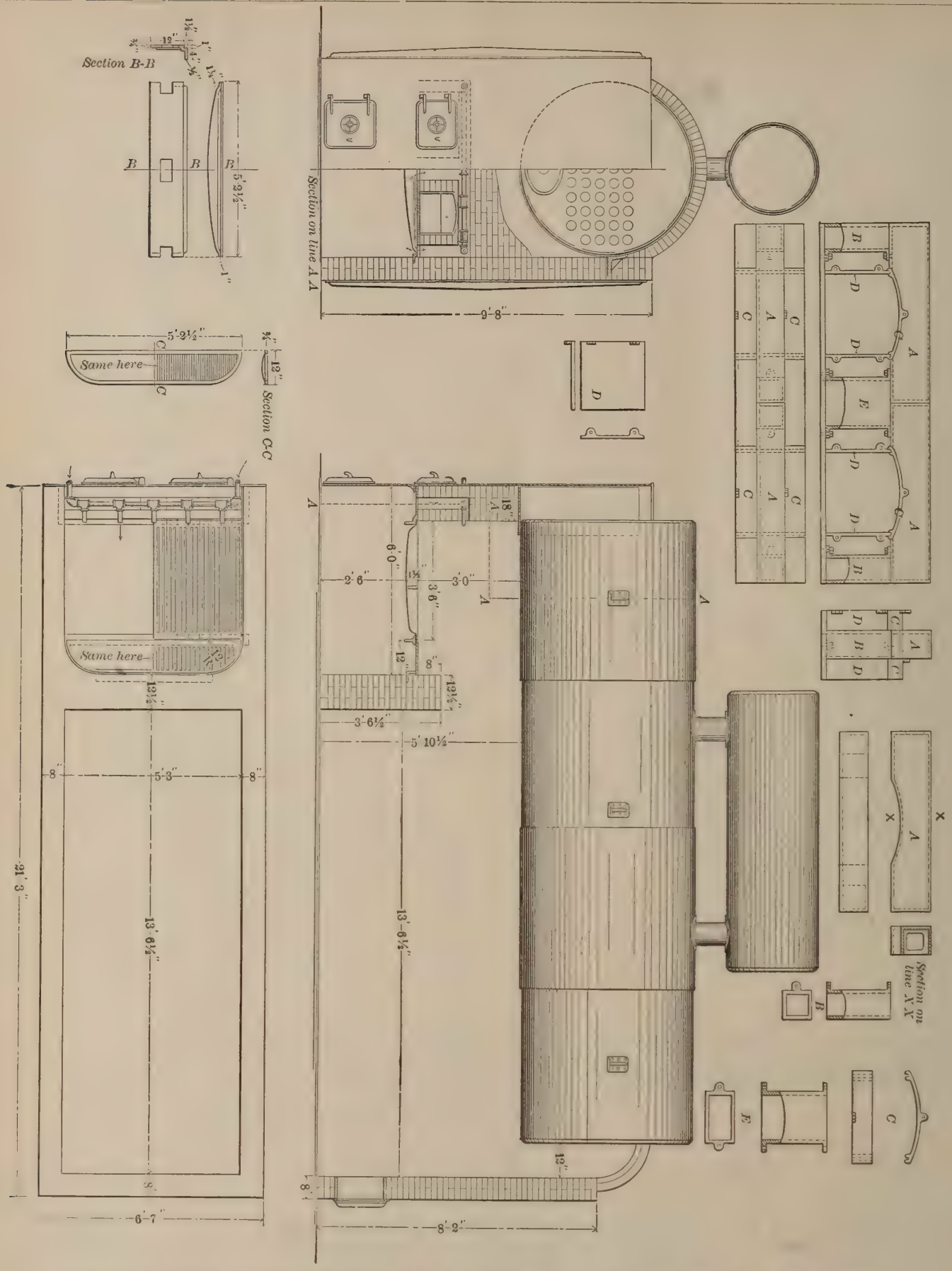

HUTCHINSON'S WATER GAS FURNACES.

The above cut is a detailed drawing of the Hutchinson Water Gas Furnace applied to stationary boilers. This is the only practical method of abating smoke nuisance on all constructions of furnaces. The system is just as applicable to locomotive or tug boilers as the stationary or returned flue boiler. The principal consists of converting a furnace into a Water Gas Furnace by supplying Oxygen and Hydrogen and taking up the Carbon as it is generated from the burning fuel. There are over 5,000 of these furnaces in successful operation, which is sufficient proof that it is no hardship to abate the smoke nuisance but on the contrary is a matter of economy to consume the gas under the boilers which usually passes of in the form of smoke and soot. Steam users generally speaking are scattering about 25 per cent. of fuel over themselves and neighbors. By the use of this device there is no fuel wasted, and all the gas is consumed immediately under the boilers leaving no soot or settlement to lodge in the flues or stick to the bottom of the boiler covering the surface of the iron with a non-conducting substance of greater density than asbastos. For further particulars address,

W. S. HUTCHINSON, 6 Washington St., Chicago.

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Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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DO NOT go about work as if you were not getting enough for it. Let your care be to get what the work is worth. If you miss this do not let that make any difference. Go at it the harder, and when you get out of it, take care not to get into the same trouble again. It may be that you will some time get a contract for less than you should have taken it. But do not let that upset you a bit. If you have nothing to pull through worse than that you will live well.

LOOK out for the regulations governing your work in the city in which you engage. There may be something not according to your way of doing business, but do not mind it. Do it according to the way it is found done until you can have an amendment adopted stating that it must be done otherwise. This is the principle to work on at all things and plumbing is not the only one.

DO NOT strive to be too little, for the bigger you feel the bigger you will count. Don't try to appear too ltttle. Do not try to be too big. But go to work as hard as you can and see what that will do. Work early and late and see if that won't help matters out some. Do more work at better prices and see how much better you will feel.

ORGANIZATION, thorough and complete, will destroy the evils we hear complained about. It is not from the inside that these reports come. It is from outside parties, parties who do not want and who do want something they do not know what. It is their ignorance of the organization that effects them as it does. It does not touch those who know what the association is doing and what it has done or proposes to do. It is from them who do not know anything about the matter, and who have not had time to study it. We do not like to speak this way about anybody but we cannot see how we can do better. Let them know what a society is, and they will be in for it all the time.

IT IS not altogether in the construction of a house, that it is made entirely hygeinic. The location of such a house has much to do with the subject. Located in a flat, sloughy place it will require drainage to make it at all comfortable or healthful. Located on a high hill it will need some protection from wind to make it the same. Located between those two it will become more nearly correct until it will be in a position to receive the proper architectural and plumbing that will make it safe. This is what we should look to. There is nothing which tends to the comfort and healthfulness of mankind so much as a house. It is needless to say that anything receives as little consideration as the building spot so far as healthfulness depends. It is of no use to go through the country to behold this. It is there with a vengeance, but it can be seen in some of our cities. It is not difficult to find places where building will be stopped by hygienic laws, but the laws of commerce seem stronger, and the hygienic problem is borne down. Such places should receive affective attention. Drainage should be placed under them, through them, and so skillfully should they be arranged in regard to these matters that no thought should be given of them. They should be known to be correct and no chance be given for any doubts regarding the matter. It is no little trouble and expense to build a building either for manufacture, business or for occupancy. This done once or twice in a life time is the most we can expect. That it should be done right is no plaything. It is a duty one owes to himself and to those around him. It should be done so that all interested in the matter, for miles around, would feel satisfied that it was done right. This is what we want to see done.

WHEN physicians become astonished at the lack of sickness, it is not always best to conclude that there is no use to look for it. Many causes may contribute to the healthfulness of a place and in a short time pass away. The proper thing to do at such times is to prepare to keep the place as free from causes that will produce sickness as you can. Cleanliness will be found to be the most direct and trustworthy of any one that can be produced.

YOU cannot keep disease entirely out of any city. That is too big an undertaking, but by presenting the proper hygienic regulations the matter becomes extremely easily adjusted towards a low death-rate.

There is one thing about English plumbers. They have the Scotch plumbers with them, and when they say they will do anything you might just as well get ready to bet that they will. We have a number of the same kind and we will bet they will accomplish what they say they will.

Plumbers, think a moment. Have you ever experienced anything you have not asked for? Have you ever been set forward in your work at times and in places you did not ask for it? Had the plumbers not put their shoulder to the wheel and pushed hard, their progress would not have been so great or so satisfactory. There are, as a result, numerous friends and fellow-workers who did not think of the turn affairs would take till they had taken them. Then sanitarians went out to hunt up the plumbers and make friends with them. We did and do not wait for them to come. We go out to find them and make their acquaintance. We attend their meetings, send delegates, and in this way we show that we appreciate them and long to have them take the proper steps regarding plumbing. You will acknowledge the advantage in this matter and will do all you can to see that our acquaintance is as large as possible. Sanitarians and kindred workers are not too large for us to gain an admittance. They are well disposed toward us all the time. They know we know a few things they do not, and we know they know some things we do not know. It is by mingling closely with each other that this state of knowing is going to be gathered. Let them attend our conventions, see us doing work, making ready for work, and they will know more about it. It will greatly add to their knowledge if they understand the theory of plumbing and drainage, and can we understand their established laws, rules, and know the whyfore of them, it will greatly add to our information.

There is no city of any size that should be without a system of plumbing. There should be ordinances and specification, and practical plumbers appointed as inspectors. Every city of the size contemplated should be made healthful in this department if in no other. We know of no other in which the work can be done so cheaply, and of none where it can possibly be done at all.

It was a bad, rainy night when the Arkansas traveler struck the house which had no cover on it, or else it was a very mild day. The one thing that was held out was, that when it did rain it was too rainy to put a roof on, and when it did not rain they did not need any. Some people are just that way. They take along and have much fun and a lot of good things, but finally the rain comes pouring down and the roof is off. They are not ready for the rain. Their physical life is out in the rain and they cannot get it in. It is not the old life they had, but one somewhat dealt with by the hard hand of dissolution. They go down by degrees, but it is the only course open to them. They cannot help it, and finally they sink into the shadow where a roof is needed no more.

LICENSING PLUMBERS.

We quote the *Plumbers and Gasfitters' Review* in regard to a matter of public utility now. This is taken principally from matter here, but it is none the worse for that. It must glean its information from this country, and the fact that it does so is proof that it is enterprising and worthy of notice. In regard to the licensing of plumbers, it says :

A question which is rapidly attracting the attention of the plumbing trade throughout America at the present time is the examination in theoretical and practical plumbing of plumbers before they can be granted licenses to do work as plumbers, in order to correct the insanitary conditions and evils which exist. At the Cincinnati convention Mr. Wade brought the question prominently before the trade. As is the physician, so is the plumber a public necessity. While the one is capable of prescribing a remedy for disease, the other arranges and adjusts the sanitary appliances in a residence in such a manner as to prevent — to a great extent — disease from being caused by them. Then why should not the plumber, like the physician, be subjected to a thorough examination before being permitted to follow his trade? We venture to say that none will endeavor to answer.

Let the plumber after applying for a license appear before an examining board composed of practical plumbers, and be able to demonstrate the practical and theoretical working of sanitary science so far as it affects plumbing. Not only should this be required of the plumber who seeks a license, but also of the journeyman and the apprentice. Both should be compelled to undergo strict examinations before being allowed to perform the duties of the trade. As suggested by Mr. George, Chicago's chief inspector, "There should be a legally constituted municipal board, composed of a representative of the health department and practical plumbers whose duty it should be to thoroughly examine every applicant for a plumber's license. The members of this board should be men who are known to be thoroughly experienced in their trade and above reproach." The soundness of this theory is beyond question.

In this age of advancement of industry the plumbers of America are keeping well up with the times.

We do not know but that we are ahead of the plumbers of England. We have license in many of our cities and we are going to have something more done. We have not a Parliamentary law in view, but through our House and Senate we may be able to get such a law adopted. It makes no difference, though, as long as the States' Legislatures do their part of the work ; for whatever laws the different states enact on the subject will do as much good. It is only starting now, but wait till we see what a few years will bring forth.

NOTES AND NEWS.

Three and two-tenths grains make one caret ; 150 carets in one ounce of Troy weight ; 1,800 carets in one Troy pound of 5,760 grains.— *Scientific American.*

Dr. William A. Hammond says that even well to-do Americans require more rest than any other people in the world, and get less. He thinks a human being should have a succession of labors and diversions as a farm has rotation of crops.

A telegram from Buda Pest announces that a French engineer has discovered a new explosive which he calls "fortis." He has asked for permission to undertake, at his own expense, the work of blowing up the famous rocks known as the "Iron Gates" of the Danube, which have hitherto resisted the action of all explosives.

An English inventor has constructed a novel device to do away with the enormous pressure of water against the bows of ocean steamers. It consists of one or more screws on each side of the bow, which throws the water aside and creates a dry well in front of the vessel.

Cotton of a red color is being grown in Georgia, it is said, where an acre of cotton plants have stalks, leaves and flowers, every stalk of which is a deep red color. This crop is the product of a seed taken three years ago from two stalks of red cotton found in a cotton field. Attempts are being made to perpetuate this variety.— *Boston Journal of Commerce.*

In science, a writer says, that while as yet we have discovered no way of avoiding contagion which comes to us in the air, we are beginning to find out the important fact that the air does not become contaminated with bacteria unless they are allowed to dry. Recent investigations, he adds, have shown a smaller number of bacteria in the air of a well kept sewer than in that of poorly ventilated school room.

The detrimental effect of scale on the inside of a boiler depends considerably on the density of the scale as well as the thickness. Some substances form a harder scale than others, and some are more impervious to water than others. It is the dense hard scale, such as is formed by the carbonates and sulphates of lime, that reduces the transmission of heat.— *The Stationary Engineer.*

A new and improved barrel has been perfected. Each alternate stave is of a soft variety of wood and slightly thicker than their harder neighbors. When the hoops are driven down on to these barrels, the cracks which are noticed just where the staves are put together are closed up by the hard being pressed into the soft staves, and the thicker section of the latter causes them to overlap the edges of the hard staves. Thus the barrel is made tighter than the ordinary, and will be found much more durable.— *The Manufacturers' Gazette,*

Some experiments were recently made at the Riverside Iron Works, Wheeling, West Virginia, on the comparative liability to rust of iron and soft Bessemer steel. A piece of iron plate and a similar piece of steel, both clean and bright, were placed in a mixture of yellow loam and sand, with which had been thoroughly incorporated some carbonate of soda, nitrate of soda, ammonium chloride, and chloride of magnesium. The earth as prepared was kept moist. At the end of 32 days the pieces of metal were taken out, cleaned and weighed, when the iron was found to have 0.84 per cent. of its weight and the steel 0.72 per cent. The pieces were replaced, and after 28 days weighed again, when the iron was found to have lost 2.06 per cent of its original weight, and the steel 1.79 per cent.

An ingeniously contrived locomotive, designed by M. Rolland, for use in mines, has been recently built in Belgium. The locomotive is provided with a tank that holds 0.55 cubic metre; the water is heated to 206 deg. Cent., or an absolute tension of 16 atmospheres, by a boiler placed on the furnace, this being sufficient for a steady run of from 3 to 4 kilometres. The heating is effected by a peculiar system of steam jets, known as the Bebe method, the heat thus stored up in the small space afforded gradually evaporating the water required to run the machinery.—*Invention.*

M. Mercradier, having had to use microphones in delicate measurements, has found occasion to require forms which might remain to the ears for hours together without fatigue. He has constructed telephones weighing only 50 grammes (against 400 grammes of the ordinary type), and of 1 inch to 1½ inch in diameter. Two of these are connected by a steel magnetic spring passing under the chin, and are pressed closely to the ear-hole. The steel spring serves also as electric connection for two of the contacts, thus acting mechanically, magnetically, and electrically at the same time. He gives his arrangement the name of the "bi-telephone."

VENTILATION AND HEATING.*

BY W. G. BLISH.

The question of getting the foul air out of a room is as important as getting the fresh air in, for air wont flow into a room that has no outlet to let the existing air out. Hot-air heating has sometimes failed on this account. The cold air not being drawn off at the bottom, the warm air that does enter rises to the ceiling, there struggles to escape and does escape from every crack and pore, leaving the cold air stagnant near the floor. The location of ventilating flues is a matter for consideration. It is better not to compel the cold air falling down the windows and the cold walls to flow clear across the floor and over our feet before it can escape. We should also study, particularly in large rooms, to have all parts of the room benefited. For instance, if we were to place a hot-air register at one end of such a room and the foul air openings at the opposite end the air in being cooled by contact with the walls might, as it falls down there, be drawn off without properly changing the air in the center of the room. In such a case both inlets and outlets must be so distributed that the ventilation will be equalized. It must also be borne in mind that flues in external walls, which are open near the floor, without the application of artificial heat, or unless thoroughly protected from outside cold, will generally fail to work. The cold from the outside is quite sure to prevent and even to reverse the draft. There is also some risk in ventilating several rooms directly into one flue. If the flue is not ample and properly warmed some of the rooms will, at times, draw a part of their supply from the flue instead of discharging into it.

I doubt the advisability of turning the foul air into the smoke flue as is often recommended, for there are a great many days in the year when it would seriously interfere with the draft and likely cause the apparatus to smoke, or leak gases. Many of you have probably had some experience with trying to run a fire with an open stove-pipe hole in the chimney; it always ruins the draft. The check-dampers used by stove makers demonstrate how a very small inlet of cold air in a stove pipe effectually cuts off the draft. Besides, chimneys are almost never made large enough to answer for both smoke and ventilation. An ordinance recently adopted in Worcester, Mass., makes it obligatory in that city to vent water closets into a heated flue or into the kitchen chimney. The latter method should be condemned and never permitted under any circumstances, The plan of making the ventilating flue large enough to permit the smoke flue to run up inside of it is a good one; also the applying of artificial heat as a gas jet or steam-pipes, etc., is not only good, in some cases it is actually necessary to create a proper current. I might add here that an opening over a kitchen stove to take out the steam and smell of cooking is a good thing. It should be 18 inches or two feet square to give good results. The draft of such an opening instead of allowing the smells to permeate the rest of the house will tend to draw air from the surrounding rooms.

It is too often not taken sufficiently into account that it requires a definite rise of temperature in a flue to create a draft. It is quite commonly supposed that a flue or a chimney always draws of itself; that it is the nature of the thing to draw. This is true only where the air within the flue is warmer than the air without. Even warm air does not rise unless it is warmer than the air that surrounds it. In the summer the flues are much of the time cooler than the warmer air outside, hence the draft is downward instead of upward. All are familiar with the experience of trying to start a fire when the smoke instead of going at once up the chimney persists in pouring out into the room; or you may have started up only a little fire for a short time in the morning, and for the rest of the day smelled the odor of some partially burned substance in the stove. The air in a flue one foot square and ten feet high weighs, at ordinary room temperatures, about three-quarters of a pound. A rise of ten degrees will make this air lighter by only about one-quarter of an ounce. This one-quarter of an ounce then is the measure of the draft in that flue for that relative temperature, and is the power that would have to keep that three-quarters of a pound of air in motion against the friction of the sides, and of the bends if there were any, of ten feet of flue. In moderate weather, as in many days we have in the spring and fall, the temperature within and without is so nearly alike that ventilation is quite uncertain and frequently fails altogether without the special application of heat. It should not be overlooked in considering the Ruttan system, which has been recommended here for school houses, that it requires a large amount of extra heat to draw the air from the top of a building to the basement and make it traverse the long tortuous passages through which it has to pass. The warm air of the rooms resists being drawn downward, hence with a little neglect the ventilation is apt to reverse and carry the odor of the fecal matter in the drying rooms to the study rooms. In practice this difficulty is found to exist.

It is very important that flues should be sufficiently large. It is impossible to give any definite rule because conditions vary so, but the average of authorities would give for a continuously occupied room about a square foot of opening for each six or eight persons, and the same for every two or three gas lights. For temporary occupancy as a hall or church the lowest allowance should be about one square foot for each fifteen persons. Calculated by this rule we have not a decently ventilated hall, church or school building in the city. Just note the condition in this hall. In fact there is no provision for ventilation whatever; for what little was made by the architect has been closed. This hall filled and all the gas jets burning should have an aggregate of not less than fifty square feet of openings, or the equivalent of a flue five by ten feet for the admission of pure air and a like amount for the escape of foul air. The air in a flue of even that size, to do its work properly, would have to traved with a velocity of four or five feet per second. To create this velocity by natural ventilation would require that the flue for the outgoing air be smooth, without bends, and 25 feet high, and the temperature inside exceed the outdoor temperature by ten degrees. It must be taken into account also that a motion of four or five feet per second of air within a room amounts to a strong draft which for the incoming air would have to be modified in some way before it should be allowed to reach us.

It has been a much discussed question whether we should ventilate from the top or the bottom of a room. Expired air at the same temperature is slightly heavier than pure air, but, when first

*Reprinted from the Proceedings of the Sanitary Convention at Niles, February 5 and 6, 1891. Supplement to the Annual Report of the Michigan State Board of Health.

expired owing to the heat it receives from the air passages, it tends to rise. This needs hardly to be taken into account, however, for by the law of diffusion of gases it is soon found, where the air of the room is unchanged, that the foul air is pretty equally distributed. Hence the best way to dispose of the foul air is to locate the openings so as to draw off the air that has been longest in the room, which would naturally be the most impure. If the entering air is the warmest it rises at once to the top of the room. In that case we would expect to find the air most impure at the bottom. If we were supplying our rooms with air cooler than the objects in the rooms we should find our foulest air at the top. In short, if the pure air is warmer than the room ventilate from the bottom, if cooler, make the openings for the foul air at the top. It is also better to let fresh air in, if warm, at the bottom, and if cool, at the top. The ideal method of warming and ventilating our rooms would be to heat the floor and the walls for a short distance above the floors, and to introduce the fresh air, somewhat cooler than the room, through a number of small openings distributed overhead. The foul air openings in this method should be close to the floor, and with large rooms other openings should be made in the floor at different parts of the room and connected with the same outgoing flues. This would give us a cool head, cool air to breathe — air that would invigorate and refresh, and another grand thing would be accomplished that is realized in but few houses — our feet would always be warm.

A thing no less important than the ventilation of the rooms we occupy is the ventilation of basements. Most houses have also inclosed spaces under them with even the surface soil with its decomposing matter. These damp, unventilated spaces are extremely bad. The pressure of winds outside forces the gases naturally existent in the soil, and the musty air of these spaces, up through the cracks of the floor, and the house itself acts as a flue sucking them up to mingle with air we breathe. Spaces under floors should be ventilated, not with the little two by four hole sometimes made for that purpose, but by an ample opening. A great source of dampness in cellars and under floors in warm weather is the condensation of moisture from the air. These spaces, being cooler than the air without, condense more or less of the moisture of the air that gets access to them. A greater circulation of air would, in addition to ventilating, remedy the difficulty by warming the surfaces with which it comes in contact to so nearly its own temperature as to prevent the condensation taking place. Too little pains, too, is taken to make foundation walls and the cellar bottom itself water and air tight. Damp underneath means damp, musty floors and carpets. Nothing adds more to the health and comfort of a dwelling than dry, warm floors. Flooring should be narrow and well seasoned before putting down. Wide, unseasoned boards shrink, leaving great cracks to collect dirt. A very unclean thing to do is what nearly every housewife does do when she attempts to clean the floor ; that is to flood the floor with water and mop the cracks full of the filth that should have been removed. The soaking also swells the boards so that when they dry again the cracks are ready to receive still more filth, making a source for evil smells and a hiding place for vermin and disease germs. Floors ought to be painted and made as nonabsorbent as possible. The saving in labor also to the housewife would well repay the expense.

I cannot forbear a word specially about sleeping rooms. They are often, in fact generally, too small, and nearly always closed up too tight. It should not be taken for granted because we do not smother in a night that therefore the room is well ventilated. We can smother gradually, just as surely as if it took place quickly. Eight to ten hours of every twenty-four, or more than one-third of our lives, are spent in theee rooms in a recumbent posture, with the head buried in pillows and coverlets in such a way that the air cannot circulate freely about our nostrils. At best the circulation of the air of a sleeping room in the quiet of the night is not the same as in a living room in the day time where there is more or less moving about, opening of doors, etc. We can readily see then that there is special need for ventilating sleeping rooms. If you are not already using some efficient method, lower an upper sash a little, according to the weather, and don't shut up the opening with a close blind or a heavy curtain, especially when the temperature outside is so nearly like that inside that no change of air can take place. If your room smells close in the morning, if your mouth tastes bad or you feel as though you were not refreshed, take the hint and try the open window a few nights, or long enough to get used to it, and you will be surprised at the result. Some people never bathe. Those who practice bathing feel so nasty without it that they can not dispense with it. It is the same with the pure air habit ; only those who have been used to having pure air can realize what it is to be deprived of it. Don't be afraid of taking cold because it is cold without, for bedclothes will keep you warm. There are more colds contracted from breathing foul, warm air than from breathing cold, pure air. Neither should you have any of that superstitious dread so often entertained of night air. If you breathe at all at night you must breathe night air, for there is no other. Don't be afraid of it because you imagine it is damp. Ordinary dampness doesn't hurt air for breathing. You never think of any harm from breathing the air of a long spell of rainy weather, or of an ocean voyage, yet air couldn't well be damper. It is true that damp clothes are not good, but ordinary night air will not even make your room damp, for being cooler than the objects within the room the tendency as it warms is to take up moisture instead of deposit it. Damp or dry, night or day, have air, fresh, and lots of it.

THE PURO TRAP.

In designing this trap it was sought to keep in mind, by theory, experiment and practice. There has never been any question that all the *positive* requirements of a trap are best fulfilled—indeed almost ideally fulfilled by the plain S trap. Its interior is smooth, its water-way is free, and its self-scouring quality is complete. But it has one defect; it is subject under certain conditions, to siphonage. Hence, the problem seemed to be, to preserve all the good qualities of the S trap and eliminate its one weakness.

The usual answer to this problem has been and is the use of a vent pipe from the trap to the outer air; but this device is so cumbersome, so costly, so frequently ineffective, and has so many defects of its own, as to make it unsatisfactory. A recognition of these facts has stimulated invention in a rather remarkable degree, and the result is a large number of traps, differing in form, but all seeking the same end and few without some merit. The trouble has been that inventors have as a rule avoided one defect by running into another.

The chief danger recognized has been siphonage. To avoid this, traps have been made of such large capacity as to diffuse the water entering them, making them slow of discharge, not self-scouring, and hence retaining deposits. Others have had so many bends and angles and corners unwashed by the flow as speedily to fill up with filth. Others have had moving pacts liable to wear out and to derangement. Still others have had mechanical obstructions to the flow, preventing not only their own scouring but also the proper flushing of the waste-pipe.

In the Puro it is believed that all the advantages of the S trap have been retained, that its liability to siphonage has been obviated, and that no advantage has been gained in one direction at the cost of a defect in another.

The cut shown is that of the P. trap. It will be seen that in shape it is an easy curve, that the interior of the trap proper is perfectly smooth and rounded, and that the diameter of the enlargement is about double that of the inlet. A small partition or funnel is formed near the bottom of the trap. Were this omitted, the trap would be effective to a certain degree, but its interior would not all be scoured, and in case of siphonage, much of the water could be thrown out. This funnel serves two purposes. It will be noticed that its outer wall is set at a slight angle to the line of flow. Hence, while most of the water in discharge passes across its mouth at the bottom, a small proportion is deflected and passes upward through its interior and is thrown in different directions against the upper portions of the trap, thus creating as it were an

artificial scouring of those parts against which the water otherwise would have but little force. The second office of this funnel is to facilitate the admission of air into the trap from the inlet side when the discharge from the fixture above ceases, or, in case of siphonage from the discharge of other fixtures, and thus to save as much as possible of the contained water for a seal. Experiments with siphons have shown that air entering at the crown of a siphon acts much more quickly in arresting siphonage than when taken at any other point. In the case of the Puro trap, the water flowing up through the funnel is much broken and mingled with air, and through this channel air finds a much more ready admittance to the crown of the trap than if it were obliged to struggle up through a solid mass of water. This sudden "breaking" at the final moment of discharge enables the trap to retain a large portion of its water, enough indeed to give it a good seal, even though no tailing flow filled it up again to its overflow point. On this facility in the admission of air the Puro trap rests its claim to be non-siphonable.

The funnel, which at first sight might appear to be an obstruction to the flow, has in fact quite a contrary effect. The strongest flow in any part of the trap is across the bottom of the funnel, which is found in practice to act as a *vena contracta*.

The Puro is made both of brass and of lead and in the P. and the S. forms.

A gentleman well known as a sanitarian and as the inventor of a very ingenious trap-vent, some time ago procured, unknown to the owners, a Puro trap for the purpose of testing it with his own apparatus designed especially to demonstrate the liability of traps to siphonage. The first intimation that the owners had of the occurrence was when he returned the trap with the statement that he had been unable to break its seal.

LETTER FROM THE SECRETARY OF THE HEALTH ASSOCIATION.

PITTSBURG, Sept. 10, 1891.

MR. J. C. AMBLER:—Your letter of the 3d received. Thank you very much for the interest you have shown in our fight against the smoke nuisance. We did not succeed well in our plan of having an exhibit of smoke-preventing devices in connection with the annual fall exposition of Allegheny Co. Only two parties expressed themselves as willing to go to the expense and labor of taking part in the exhibition. Fortunately, however, there is no longer the same necessity for such an exhibition as existed two months ago. Several additional agencies for smoke consumers have been established in the city owing doubtless to the advertising you were kind enough to give us in THE SANITARY NEWS, and all seem to be working hard to introduce their respective devices. A dozen or more of our leading manufacturing firms have put in smoke-preventing appliances and speak in warm terms of their success.

The Committee of Allegheny Councils which reported the Anti-Smoke ordinance adversely, on the ground that smoke consumers were neither practicable nor successful—as I wrote you in my last—agreed to reconsider the matter if the Health Association would furnish convincing testimony from manufacturers already using consumers. We were soon able to give the committee the names of all in the city who are using consumers, in order that the working of the apparatus might be inspected on the spot and we also laid before them convincing letters from these firms, as well as others from Chicago and elsewhere. The result of this testimony you will see in the enclosed scraps, which I have cut from recent daily papers. We have now every reasonable hope of seeing a good anti smoke ordinance passed by both Pittsburg and Allegheny, within the next six weeks.

We wish to thank you for THE SANITARY NEWS which has reached me regularly. I forwarded several numbers to the Pittsburg Dispatch, which reprinted Mr. Young's articles to the enlightenment of the general public. With the passage of the ordinance we do not feel that our work for a clear atmosphere will be ended. Mr. Young speaks in his last article of the carelessness and indifference of the Chicago officials in enforcing the anti-smoke law, and even of their open violation of it in several instances. With this same difficulty we shall have to contend in this city. However good an ordinance may be, past experience leads us to fear that very little, if any, attempt will be made to enforce it. If the manufacturers cannot be brought to see the economy of smoke consumption and use preventers of their own accord, the enforcement of the law will depend largely upon the zeal and activity of our association.

We have another ordinance ready for councils as soon as the smoke question shall have been settled.

You will be surprised to learn that a city as large and wealthy as Pittsburg has no system of garbage collection. Cleanly people who are willing to pay for the privilege can have their garbage removed by a private company, but the indifferent and the very poor, deposit their household refuse wherever they choose, in their own back yards, in the alleys, even in the streets without let or hindrance. I have visited the principal cities of Europe and America and have seen nothing that approximates the filthy streets of Pittsburg. I wonder that we do not have some frightful epidemic constantly with us—the only reason that we do not must be that the land is generally high, and slopes on both sides to rivers, thus allowing heavy rains to do good sanitary work. In the South side where the land is flat and the surface drainage poor, typhoid fever prevails. The papers are claiming now that typhoid fever is epidemic in Allegheny, the only wonder is that it ever abates.

We shall endeavor to raise public opinion to the pitch of forcing through our indifferent councils an efficient law for removing garbage and cleaning streets; the streets must be swept every day as is done in London and Paris.

We have a hard fight before us.

We shall depend upon the kindly interest you have manifested in our work, to excuse the inordinate length of this letter.

Very respectfully,

MRS. JOHN M. OAKLEY. Sec'y. of Health Association.

The following letters have been received and duly attended to:

PHILADELPHIA, September 9th, 1891.—Mr. Andrew Young: We notice in a recent newspaper article an extract from a report made by you, relative to the matter of effective smoke devices in the market. We should consider it a great favor if you could furnish us with the address of such party or parties as have for sale such devices as you refer to, which in your judgment have proven satisfactory when put to actual test. We congratulate you on the success whch we understand you have attained in the abating of this trouble in your city. Thanking you in advance for your attention in the matter, we are,

Yours very truly,

THE ALLISON MFG. Co., by F. R. TOBEY.

WILKES-BARRE, PA., Sept. 10, 1891.—Mr. Andrew Young: Will you please send me copy of ordinance in force in your city covering the smoke nuisance, &c. We are subject to such nuisances in this city and being a member of our City Council I would like to take some measure for the abatement of the smoke nuisance. Very respectfully yours, W. W. NEUER.

A WESTERN PLAN FOR BRINGING EMPLOYERS AND WORKMEN TOGETHER.

The builders of Sacramento, Cal., have inaugurated an entirely new departure that is somewhat experimental in its character, says *Carpentry and Building*. The plan has been on foot some time, its purpose being to bring about more harmonious relations between employers and workmen, and to create a more perfect understanding of the principles which should govern their relationship to each other. The methods by which this desirable condition of affairs is to be secured is by holding, at stated intervals, public meetings at which both employers and employees shall be present. The speakers at these meetings are chosen from the rank and file, and no paid orator with theoretical arguments will be allowed to speak, thus insuring the creation of a feeling of friendliness and harmony begotten of personal contact, and the benefit of the advancement of practical ideas and plans for the peaceful solution of local necessities.

Several of these meetings have already been held, at which remarks have been made by representatives of both sides. Among important topics that have been touched upon are shorter hours, the value of organization, the apprenticeship system and other subjects of equal moment. The subjects that have been

brought up have been discussed in the most friendly manner by the workmen as well as the employers, and the effect of the plan is already being beneficially felt throughout the various branches of the trade.

The importance, as affecting the interests of builders generally, of establishing some means for bringing contractors and workmen into harmonious contact with each other for the consideration of subjects touching their common welfare, cannot be overestimated. By these means the first and most important stumbling block in the path of more perfect understanding of the duties of each is removed, important questions that have previously been avoided are brought up for discussion, and only by discussing these duties which pertain to each, are they recognized and established. The greatest drawback to the welfare of the building trades that exists to-day is lack of comprehension of proper rights and legitimate action, and so long as the employers and workmen remain apart, just so long will the present condition of affairs continue to exist. Each interest when considered separately, without the presence and influence of the other, naturally produces one-sided and imperfect conclusions.

Mutual understanding between two parties to any discussion or condition must be arrived at before an equitable adjustment can be effected. These mutual understandings cannot be obtained unless both parties participate in the adjustment, and no adjustment can be secured until each party is willing to do its share.

The principles published by the organization in the building trades are presumably the expression of what the members consider to be just and honorable, and such conditions as are deemed unjust by the opposite side are likely to be the result of lack of understanding of the inherent equity of the case, which are arrived at through long terms of one-sided legislation. The habits of thinking thus engendered by looking at only one side of a question have increased the difficulties attendant upon bringing about a recognition of the fact that employers and employees are not opponents, but, in a measure, interdependent one upon the other.

Whatever the means that are finally adopted to establish that mutual consideration of vital topics which is to bring about more perfect understanding, one side or the other must make the first overture, and it is the duty of the employers to form such plans as may seem best to afford the employees the chance to secure a knowledge of the principles which must govern.

Employers are too frequently in the habit of finding fault with the action of trades unions, saying, justly perhaps, that their action is arbitrary and one-sided, but that this is a reason for wholesale opposition or an effort to crush them out of existence is not true. They should first be given the opportunity to correct evils which exist within themselves, and if the opportunity is not profited by steps should be taken to create organizations of workmen such as would enable united and equitable action on their part to be had. No attempt should be made to crush a union that is unreasonable in its demands without seeking first to show it the unreasonableness of its position, any more than a fractious child should be punished by its parents without being told what the punishment was for and given an opportunity to mend its ways.

Some means should be provided by every community of builders, whether the plan adopted by Sacramento is used or not, for bringing about a full recognition of the duties incumbent upon both employers and workmen. The plan of arbitration advocated by the National Association, and which has already been successfully adopted in a number of instances, offers a most excellent solution of this problem in that its prime object is to establish harmonious relations between organizations of employers and organizations of workmen in the beginning, and from this harmonious beginning the desired results are to be evolved.

CONVENIENT TO HAVE ABOUT.

A good recipe for making water proof cement, to be used in constructing aquariums, is to take 25 parts gutta percha in shreds and melt it carefully. Add 75 parts ground pumice stone, and then mix in 150 parts Burgundy pitch and melt well together.

To weld two rods of iron together so nearly that an expert cannot discover the weld, is done in the following manner: First chamfer the ends, then weld them together and then stave them up until they are considerable larger than the other part of the rods. After that take another weld and draw to a uniform size, and the job is neat and complete.—*The Machinery Market*, London.

To make tin foil labels adhere to tin collapsible tubes, use a mixture of the best fish glue and gum arabic dissolved in water. A little glycerine may be added with advantage.

To polish deer horns, scrub them with a brush and sand to take off the dirt and loose fiber, then polish with rouge and rotton stone and a cloth, and varnish with copal varnish.—*Scientific American.*

Dr. I. W. Chisholm, of New Concord, O., says that for the continuous treatment of asthma, in the intervals of the paroxysms, he has found nothing equal to paroxide of hydrogen by inhalation. He also, in conjunction with this, advises the use of strong coffee at meals, and whenever desired by the patient. For the paroxysms he finds that morphine hypodermically affords the most speedy relief.—*Columbus Medical Journal.*

Dr. James J. Levick, of Philadelphia, writes to the *Medical News:* "In case of poisoning of the hands from *rhus toxicodendron*—poison oak—recently under my care, which had reached the vesicular stage and was attended with much swelling and burning, the happiest results promptly followed the free dusting of the powder of aristol on the affected parts. The change was almost magical, so sudden and so prompt was the relief afforded. Might not this powder, applied in the early stage of the disease, do much toward preventing the ulceration and pitting of variola?"

To polish nickel-plated goods after becoming black and not worn, use rough or whiting on a rag with a little oil.

Glass may be cut with any hard tool, like a chisel, for instance, if constantly wet with camphor dissolved in spirits of turpentine.

To find the diameter of a pulley of any speed multiply diameter of pulley on main shaft by the revolutions of main shaft, and divide by the number of revolutions (or speed) required, the quotient will be the diameter in inches of required pulley.

In drilling glass stick a piece of stiff clay or putty on the part where you wish to make the hole, adhering closely to the glass, of course. Into this hole pour a little moulten lead, when, unless the glass is a very thick one, the piece will immediately drop out.

When ordinary putty becomes very hard it may be softened for the purpose of easy removal by keeping it moist for a short time with caustic soda potash, or, if the putty be painted, with nitric of or muriatic acid it will be softened in about an hour.

To make pencils for writing on glass, take spermaceti, four grammes; talc, three grammes; wax, two grammes; melt and add while agitating mimun, six grains; caustic potash, two grains. Continue heating for half an hour and run into glass moulds. After cooling inclose in wooden sheaths. To use, sharpen like ordinary slate pencil.—Ex.

REVIEWS AND NOTES.

Rudyard Kipling's new novel, written in collaboration with Wolcott Balestier for *The Century*, is entitled "The Noulahka, a Tale of West and East." It is a story of America and India. The principal characters live in a "booming" Colorado town, where the story opens, but the scene quickly shifts to the court of an Indian maharajah, whither the hero and the heroine journey to meet with most varied experiences. The story will begin in the November *Century*.

The second of Prof. Frederick Starr's articles on dress and adornment, in the Popular Science Monthly, will be published in the October number. The author maintains that dress arose from desire for ornament rather than from a sense of shame. He describes a number of beautiful garments that are made by savages, and illustrates his description with a large number of pictures.

The Nineteenth Annual Exhibition of the Inter-State Industrial Exposition will open September 16th, and close October 24th. The great building has been completely and fully decorated, and all available space allotted to intending exhibitors, for what promises to be the most complete and magnificent exhibition in its long history. The Cook County Agricultural and Hor-

ticultural Society, with a prize list running into the thousands of dollars, have undertaken a floral display that has never been equalled in this country.

In the building will be also exhibited an exact reproduction in miniature of the buildings and grounds of the World's Columbian Exposition, with magnificent electric effects; covering as it does a space of 5,000 square feet, it is one of the wonders of the modern mechanical art, and will be worth a journey to see. The Lincoln Log Cabin Association will also be exhibitors. All railroads transport passengers at excursion rates.

THE REMOVAL OF FILTH—ASEPSIS.

Where even one family dwells for any length of time its surroundings become unsanitary by reason of the heaping up and storage of filth different in kind, but all by decay, at last poisoning the atmosphere and soil, says the *Bulletin* of Tennessee. People living away off in the country, miles, it may be, from the nearest neighbor, fancy that they are exempt from all the sanitary nuisances of which they read so much about in the city periodicals. This is a great mistake. The refuse products from a single family, neglected for but a few years, breed mischief. In long periods they render the premises as foul as the worst spots of an old and crowded city. Medical journals in Europe and the older states of the American Union abound in most instructive examples showing the truth of this statement, extreme as it may appear.

Where even three or four families live in close proximity to each other the danger is rapidly magnified. The prevalent ignorance of this important fact is astonishing, especially as the boast of the present day is the wide diffusion of scientific knowledge among the people. This boast is utterally fallacious. In nothing is our system of education so lamentably deficient as right here. Even the majority of professional men, college graduates, editors, teachers, and other guides of the people, are entirely ignorant of the composition of the air they breathe, of the water they drink, and of the soil from whence they come and whither they are bound. This ignorance is dense. It amounts to stupidity. Hence the slow progress of sanitary reform in all our large cities and towns, where untold blessings would result to all their inhabitants from the systematic carrying out of five or six sanitary axioms, all summed up in the one technical term, *asepsis*, or its proper synonym, cleanliness.

The system of doctrine and practice represented by this word has, within twenty years, revolutionized the surgical and gynecological professions throughout all civilized nations, made possible operations which formerly were followed by certain death, and saved thousands of valuable lives.

Asepsis, understood and carried out by the general public, would be followed by as wonderful results as it has been in the more limited field of medicine. Only where hundreds are saved in the limited field of medical practice, multiplied thousands throughout the nation would be rescued from untimely death.

Asepsis is essentially the antidote to that accumulation of filth, which is inseparable from the process of life. It consists in the removal of filth contemporaneously with its production, thus preventing its accumulation. Dwelling houses must be continually ventilated and foul air removed from their inmates; privy vaults must be kept constantly cleaned, disinfected, inodorous, so as not to pollute the air with noxious emanations of sewer gas in its worst forms. Garbage of all descriptions must be burned up, buried, or otherwise destroyed, and all offenses by its slow decay obviated. Streets must be swept often enough to prevent the accumulation of a compost good on the farm but injurious to the atmosphere where people breathe its effluvia.

In these few sentences we outlined a system of sanitation applicable equally to the individual house, the hamlet, the city. Some houses, hamlets, and cities are models, perhaps, though very hard to find at present. However, the great public is surely, even if slowly waking up. The next twenty years will, beyond question, bring about great results.

FOR THE DIGESTION.

Miss Pearl White—"I wish you to paint my portrait." Dobbins—"I'm sorry, ma'am; but I can't do it." Miss Pearl White—"Why not?" Dobbins—"I never copy other paintings."—*Cincinnati Gazette.*

"No, Gubbins, you will never be a brain-worker." "Why not?" "Haven't got the tools."—*Dansville Breeze.*

Experience is a teacher who gives you information you cannot impart to your son for fear of shattering his filial veneration.—*Indianapolis Journal.*

"Have you read 'The Light That Failed'?" she asked the stockholder in the gas company. "No," he answered, and then he avoided her for the rest of the evening.—*Washington Star.*

"You have forgotten something, sir," said the waiter, as the diner was leaving. "Keep it for your honesty," replied the generous man.—*New York Sun.*

Jinks—"Waite would be a good man to start a church." Filkins—"Why so?" Jinks—"He has sisters enough among our leading families to start a good-sized congregation."—*New York Herald.*

Tommy—"What part of speech is 'woman'?" Papa—"'Woman' is no part of speech at all, my son. She is the whole of it."—*Judy.*

Porter—"That Kentucky gentleman refuses to occupy Room 44." Hotel Clerk—"What's wrong?" "There's a picture of some fruit hanging on the wall, and he says it makes his mouth water."—*Detroit Free Press.*

"You are grossly intoxicated, Mr. Mangle." "I know it, my love; but you told me when I started down-town this morning to exchange a pleasant smile with every one, and I obeyed your injunction."—*Boston Gazette.*

Miss Laymlow—"Really, Mr. Squirmley, I do not think that you had better take me out. You don't know what a perfect Jonah I am, and always will be." Mr. Squirmley—(seizing a long-waited chance)—"Oh, Miss Laym—Clara—let me be the whale?" Miss Laymlow—"This is very sudden, Mr. Squirmly. But I have no desire for a three days' engagement."—*Puck.*

Jones and his son took the boat for Long Branch. "I never would have believed there was so much water," observed young hopeful, gazing seaward from the iron pier. "And observe, my son" observed his father, "that you see only what's on top."—*Judge.*

Laura—"Won't you get me a novel while you are down town to-day, papa?" Mr. Figg—"If I do not forget it. Shall I buy something suitable for you to read, or something you would prefer?"—*Indianapolis Journal.*

Jeweler—"I have a good second-hand watch here I can sell you." Customer—"But I don't want a second-hand watch." Jeweler—"But there are no watches made now without second hands."—*Smith, Gray & Co's Monthly.*

"Why don't you work?" said a charitable lady to a tramp. "I would if I had tools, mum," said the tramp. "What sort of tools do you require?" "A knife and fork if you please, mum."—*Drake's Magazine.*

Minister—"Tommy, if a bad boy should dare you to, would you knock a chip off his shoulder?" Tommy—"Nop; I'd knock the head offen his shoulder."—*Kate Field's Washington.*

Jack—"I wonder why fishes can't talk; some birds do." Tom—"My dear fellow, did you never hear of a whale spouting?"—*Baltimore American.*

Bessie—"Why do you stroll so much with Jack on the sand?" Jessie—"Because that is the one thing that Jack seems to lack."—*New York Herald.*

Ethel—"I have had more than fifty offers so far this season." Maud—For the land's sake. Who from?" Ethel—"From George."—*New York Sun.*

Jack—"Whew! What weather! I'm half baked." Bess—"Why, that's just what papa said about you."—*Indianapolis Journal.*

RIVETED WATER-PIPES.

Recent mention of the use of riveted steel pipes in place of cast iron for the new water supply main of Newark, N. J., brings to mind several other instances in which light riveted pipes have been similarly used with excellent results. These pipes have been in use in the West for many years, chiefly in cases where extreme high pressure existed.

One of the largest pipe-lines of this character is the 44-inch main of the Spring Valley Water Company, which supplies San Francisco with water.

In 1872 a 11½ inch riveted wrought-iron pipe was laid in connection with the water supply of Virginia City and Gold Hill, Nev., and at one point this pipe has had to stand the pressure of a head of 1720 feet.

Another interesting case is furnished by the recently completed water-works of the city of Pretoria, in the Transvaal Republic, South Africa. The water is brought from a spring yielding 5,000,000 to 6,000,000 gallons daily, and there are fifty miles of mains, consisting of thin lap-welded steel tubes, eighteen inches in diameter. As bullock carts furnished the only means of transportation, it was out of the question to ase heavy cast-iron pipes.

PLUMBING NOTES.

The commissioners of Indianapolis awarded in five parts, as advertised, the contract for the erection of a county jail. The masonry, which includes the excavation and foundation, was awarded to Koss & Fritz on their bid at $7,700, with August M. Koon and Fred Laakmann as sureties. The cut-stone work, including encaustic tiling and concrete, hollow tile floor, arches and brick work, was awarded to G. Ittenbach & Co., their bid being $35,700, with Daniel Moninger and August M. Koon as sureties. J. F. Farrell was awarded the contract for the steam-heating, and plumbing on a bid of $5,300, with W. T. Brown and Emil Fertig as sureties. Conrad Bender secured the carpenter work, including hardware, building iron, etc., roofing, painting, etc., on a bid of $15,589, with August Woerner and Charles Krauss as sureties. P. J. Pauly was awarded the contract for the iron-work at $43,500, the sureties being Charles E. Coffin and Charles E. Holloway. The bids were in each department the lowest, and the bond offered proved satisfactory to the board. The masonry work to be finished April 1, 1892, and the carpenter work Aug. 10, 1892. It is designed to have the jail ready for occupancy in October or November, 1892. The contract for the iron locks includes a lever-lock, but if the Pauly patent locking devices are used, the additional cost will be $6,000.

F. W. Browne & Co. send the following out to the trade: I take pleasure in informing you that I have removed from the old stand, 1734 Wabash avenue, to 128 Eighteenth street, bet. Wabash avenue and State street, and that I am now open to do business in brass goods, iron pipe, fittings and general plumbers' supplies, and in connection with the business will have electro-plating works and a machine shop for general repairs. By prompt and courteous treatment to all my old friends and customers I hope to merit a fair share of their patronage.

The following is enclosed to us by Mr. E. Baggot who requests its publication. We are glad to receive such for publication, but regret the sad misfortune that has overtaken Mr. Frank A. Wells: Mr. Frank A. Wells, president of the Syphon Closet Co., met with a very serious accident August 24th, while on his way with his brother, Dr. Wells, to spend a few days in the Adirondacks at Northville. The driver of the stage made a short turn which turned the stage over, throwing off the passengers. Mr. Wells was the worst sufferer, having his right leg broken, left arm dislocated, and being badly bruised up. He is now at St. Luke's Hospital, 5th avenue and 54th street, New York. His friends will regret to hear of his mishap.

In the court house at Columbus, Ohio, was a bad state of smells. It had been searched all over but nothing found. Recently Superintendent Baker had a practical plumber take the ornaments about the gas fixtures apart, when it developed that almost every one of them was the shield for a leaking joint. This leakage was so small at each place that it defied detection till the brass was removed as above stated, and instead of being in the basement, as was for a time supposed, it was going on at nearly every jet in the halls, court rooms and offices. The joints are being tightened up and the leakage stopped. Mr. Baker says the investigation develops that the contractors who put the pipes in when the court house was built did not do the work properly and the leak has been going on ever since. Mr. Baker says he has made search for it, but never found these leaks.

Michael McGreeney, 20 years of age, Providence, R. I., while working on a trench for sewer connections at 62 Welden street, Monday afternoon, was buried by the caving in of the bank. He was dug out immediately by other workmen and conveyed to his home on Cross street, where Dr. King attended the not seriously injured man.

From Irving A. Watson, Secretary, Mr. Andrew Young has received an invitation to deliver a lecture before the American Public Health Association at Kansas City, October 20-24. He will prepare a lecture and will attend the meeting.

The Plumber's Union at Denver, celebrated Labor Day by playing ball on the Werden grounds. The Seniors defeated the Juniors in a well played game, the score being 19 to 17. The game was not decided until the last man was out. The heavy batting of the Juniors was the feature of the game. Warren, Morris and Ruda each made home runs. Allen pitched a good game and was well supported. Joe Lohbeck was the umpire.

Editor The Sanitary News, allow me to thank the printers of the best plumbers' paper printed in this country or any other country, so far as I know, for the general good work which they did on my article on "fresh air pipes," in Sept. 5th number, and they are certainly entirely excusable for the slight entanglement of two paragraphs near the end. "Owing to the much shorter conduit" which now appears at the beginning of the last paragraph, should close the paragraph next above.

I find Mr. Editor, that there are many plumbers who do not take your paper, or I may say, our paper. I always recommend it to all I meet; I am sorry to say, however, that many of them prefer to read trashy novels. To all such the rigid examination through which plumbers will be required to pass in the near future will try their souls. John F. Jerrard.

Mr. Robert Griffith has quite a reputation given him and his wife by the papers of this country. They stated that Robert Griffith and his wife, Elizabeth, were caught in a fight one night and Robert was taken down to the police station. This caused a little merriment until a paper was sent from New York containing quite an account of the affair. Then Mr. Griffith walked down to the police station and was informed that Robert was wrong. That William Griffith, living on Wesson street, was the man meant. This was all right with Mr. Griffith, but in order that those who know him throughout the United States, might see and believe it, we wish to make the remark that Mr. Robert Griffith and his wife do not indulge in any such scenes as this. There are no better citizens in the city, and when their numerous plumber friends see that article they may lay it to the slip of a reporter and not to their national ex-President. He will never be brought up under that charge or any other. We are glad to say what we have said regarding this family, for if all were like them, there would be no need of laws.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Armitage ave., nr Clarkson street, H. Breyer, Jr., 1706 Milwaukee ave.

Armitage ave. and Mozart street, H. Breyer, Jr., 1706 Milwaukee ave.

557 Albania ave., Harvey & Mose, 665 W. North ave.

4085 Atlantic ave., Kuhn Bros., 4111 State street.

Albany ave. and Fillmore street, Wm. Sims & Sons, 588 W. Madison street.

176 Ashland ave., Hamblin Plumbing Co., 348 S. Robey street.

335 Adams street, J. H. Kilian, 333 22d street.

61 Bingham street, H. Breyer, Jr., 1706 Milwaukee ave.

Burtes street, S. of 47th, C. Kostlevy, 218 W. Eighteenth street.

6433-37 Bishop street, J. Bain, 6338 Justine ave.

Bissell street and Webster ave., A. Keeley, 25 E. Washington street.

111 Cornelia street, W. Anthauer, 538 Milwaukee ave.

360 Cortland street, Harvey & Mose, 665 W. North ave

35 Cedar street, P. Jaeschke, 759 Clybourn ave.

6342 Carpenter street, J. Monahan, 1636 47th street.

83 Cleaver street, C. Breyer, 833 Milwaukee ave.

Drexel ave. and 66th street, D. Walsh, 6758 S. Chicago ave.

1020 Dudley street, H. Breyer, Jr., 1706 Milwaukee ave.
3741 Dearborn street, P. Schmidt, 4928 State street.
31 David street, Harvey & Mose, 665 W. North ave.
4016 Ellis ave., J. Denniston, 148 N. Clark street.
86th street and R. I. tracks, R. V. O'Donnell, 960 Spaulding ave.
Eighteenth street, nr Rockwell street, Steiner & McFarlane, 918 W. 21st street.
11 Elgin street, J. H. Kilian, 333 22d street.
14 Elk Grove ave., C. Breyer, 833 Milwaukee ave.
495 Fullerton ave., H. Breyer, Jr., 1706 Milwaukee ave.
48th street, E. of Center ave., C. J. Boyd, 805 47th street.
409-11 Fairview ave., Harvey & Mose, 665 W. North ave.
47th and Wallace streets, Kuhn Bros., 4111 State street.
37 Fourteenth street, Chas. Uher, 524 W. Eighteenth street.
98 Fulton street, Watson & Davidson, 301 Wabash ave.
43d and 14th streeet, C. Kostlevy, 218 W. Eighteenth street.
W. 41st street, S. of Thirteenth street, C. Kostlevy, 218 W. Eighteenth street.
41st and School street, J. Lemblem, 256 31st street.
420 Forest ave., Garner & Bahn, 1740 Milwaukee ave.
57 Gault Pl., E. Sheehan & Co., 222 Illinois street.
Honore and 70th street, D. Dewar & Co., 6312 Wentworth ave.
6620 Honore street, D. Dewar & Co., 6312 Wentworth ave.
1050 Hancock street, H. Breyer, Jr., 1706 Milwaukee ave.
Hoyne ave., S. of Burnett street, Bowman Bros., 687 W. Chicago ave.
181 Humboldt ave., H. Breyer, Jr., 1706 Milwaukee ave.
155 Heine street, Harvey & Mose, 665 W. North ave.
201 Hersey street, F. W. Page, 665 Armitage ave.
Hoffman ave, S. of Elston ave., Garner & Bahn, 1740 Milwaukee ave.
612, 680, 630 Halsted street, Morris Bros., 3442 S. Halsted street.
3148 Indiana ave., J. Emblem, 256 31st street.
Jensen street, N. of Addison, H. Bauer, 232 E. North ave.
Kedzie ave, S. of Nineteenth street, J. T. Bunting, 477 W. North street.
Kidzie ave., S. of Twelfth street, C. Kostlevy, 218 W. Eighteenth street.
740 Kramer street, C. Kostlevy, 218 W. Eighteenth street.
140 Lewis street, F. E. Goggin, 131 Center street.
Langley ave. and 68th street, D. Walsh, 6758 S. Chicago ave.
Leavitt street and Fullerton ave., H. Breyer, Jr., 1706 Milwaukee ave.
Laurel and 34th street, Steiner & McFarlane, 918 W. 21st street.
5740 La Salle street, J. Sands, 5448 State street.
1147 Maplewood ave., H. Breyer, Jr., 1706 Milwaukee ave.
1 and 8 Magnolia ave., S. T. Davey, 461 Lincoln ave.
Madison ave. and 73d street, J. & B. Rourke, 5434 Lake ave.
444 Marshfield ave., Low & Walsh, 112 W. 48th street.
5434-36 Monroe ave., J. P. Thompson, 272 55th street.
6013 Morgan street, D. Dewar & Co., 6312 Wentworth ave.
97th street and C. & E. I. R. R., J. Conraths, 5902 State street.
Newberry ave., Chas. Uher, 524 W. Eighteenth street.
North and Western aves., B. Breyer, 833 Milwaukee ave.
Oakley ave. and Parmalee ave., Love & Liebold, 1548 Wabash ave.
64 Osgood street, J. Lenz, 357 Larrabee street.
Paulina street and Sunnyside ave., Schneider Bros., 725 Sheffield ave.
Pleasant ave. and 93d street, T. B. Bryson, 6335 Wentworth ave.
Paulina and Twelfth streets, A. H. Foster, 800 W. Twelfth street.
214 Park ave., C. F. Kleutz, 352 Elston ave.
320 Polk street, W. G. Coles, 194 S. Western ave.
362 Park ave., D. Jack, 882 W. Lake street.
318 Robey street, Bowman Bros., 687 W. Chicago ave.
Robey street, nr. Fullerton ave., F. W. Page, 665 Armitage ave.
948 Roscoe street, H. W. Harker & Co., 550 Lincoln ave.
933 Root street, A. Miller, 4300 Wentworth ave.
Robey street and Archer ave., J. J. Clark, 119 E. Twenty-second street.
Sixty-eighth street and Langley ave., D. Walsh, 6758 S. Chicago ave.
Sixty-ninth Ct. near S. Chicago ave., J. Wittich, Seventy-sixth street south of E. Chicago ave.
3634 Stanton ave., B. A. Finn, 136 Thirty-fifth street.
Sacramento and Colorado aves., W. Rankin, 453 W. Madison street.
Sacramento ave. south of Twenty-sixth street, C. Kostlevy, 218 W. Eighteenth street.
265 St. Louis ave., G. J. Mertz, 2208 Archer ave.
Sangamon and Sixty-sixth streets, J. Bain, 6338 Justine ave.
624 Southport ave., H. Bauer, 232 E. North ave.
264 Sheffield ave., C. Breyer, 833 Milwaukee ave.
Sixty-first street and Wentworth ave., Lyon & Lee, 6215 Wentworth ave.
580 Thirty-second street, Chas. Uher, 524 W. Eighteenth street.
719 Taylor street, P. J. Morrissey, 417 S. May street.
Thirty-fifth Ct. north of Halsted street, Steiner & McFarlane, 918 W. Twenty-first street.
375 Twenty-third street, J. H. Kilian, 333 Twenty-second street.
867 20th street, J. Hoiss, 609 W. Twenty-first street.
1011 20th street, J. Hoiss, 609 W. Twenty-first street.
4736 Union ave., C. J. Boyd, 805 Forty-seventh street.
5127 Wabash ave., E. Hennessey, 3247 State street.
486 Wood street, Harvy & Mose, 665 W. North ave.
1126-28 Washington street, L. Griffin, 169 W. Madison street.
88 Whipple street, J. T. Bunting, 477 W. North ave.
987 Washtenaw ave., Harvy & Mose, 665 W. North ave.
1005 Washtenaw ave., Harvy & Mose, 665 W. North ave.
957 Washtenaw ave., J. Hoiss, 609 W. Twenty-first street.
4520 Wallace street, H. Watt, 300 Dearborn street.
142 Wilmot ave., Garner & Bahn, 1740 Milwaukee ave.
Wood & Rice streets, J. O'Malley, 215 Wells street.
2969 Wentworth ave., J. Teutsch, 2961 Wentworth ave.
Yale street, south of Seventy-first street, Lyon & Lee, 6215 Wentworth ave.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Apartment houses: Turner & Bond, 8 two-story flats, 3031-43 Butler street; cost, $16,000. F. Schield, 2 three-story flats, 203-205 Blackhawk street; cost, $45,000. A. H. Fitch, six-story flats, 3663-67 Wabash avenue; cost, $65,000. J. J. Rier, five-story flats, Fifty-ninth street, near Clark street; cost, $10,000. H. G. Loomis, four-story flats, 4101-03 Grand Boulevard; cost, $56,000. F. C. Hesth, 2 two-story flats, 2614-16 Indiana avenue; cost, $22,000. Stores: William Ryan, 4 four-story stores and flats, 196-202 Fifty-fifth street; cost, $30,000. J. F. Winter, 8 four-story stores and flats, State street and St. Cloud Court; cost, $60,000.——Boston, Mass.: Willard M. Bacon has plans for 2 four-story apartment-house, at 847-49 Boylston street.——Brooklyn, N. Y.: Charles G. Jones has planned a church edifice for Brooklyn Baptist Church Extension Society, to be erected at Eighth avenue and Sixteenth street, at a cost of $21,000. E. G. Collner has plans for a $24,000 residence to be built for himself at 397 Sixth street.——Detroit, Mich.: Malcomson & Co., stone church, 671 Cass avenue; cost, $26,000.——Minneapolis, Minn.: M. A. Pratt will erect a stone dwelling at 2741 Park avenue, to cost $34,000.——New York City, N. Y.: Plans are being made for the erection of a twenty-six story office building between Battery Place and Morris street, on Broadway; owners and architects, F. L. Dinkleberg, Chas. W. Dayton, and others. Edgar Bowine is preparing plans for the Harlem Library. The building will be on One Hundred and Twenty-third street, near Lenox avenue; will be four stories high and will cost $50,000.——Dallas, Tex.: The Security Mortgage and Trust Co. will erect a six-story building; cost, $140,000.——Danvers, Mass.: Little, Brown, & Moore have completed plans for a building for the Peabody Institute to replace the one recently destroyed by fire.——Denver, Col.: Messrs. Lee & Pool have made plans for a residence to be erected at Denver Heights, at a cost of $50,000.——Kalamazoo, Mich.: The city engineer can give information about the proposed construction of a large hotel.——Kankakee, Ill.: A $30,000 frame factory will be erected; architect, J. F. Pott.——Milwaukee, Wis.: M. E. Bell has planned a dwelling for J. Breunig, to cost $15,000.——Reading, Pa.: Rev. Father J. Borneman is

the leader in a movement to erect a large Parochical school building in the suburbs of the city, to cost $80,000.——Sycamore, Ill.: C. F. Whittlesey has planned a frame dwelling for F. B. Townsend to cost $10,000.——West Superior, Wis.: The Board of Education has appropriated $110,000 for the purpose of erecting new school buildings. Address Commissioner Sloan for details.

HEATING AND LIGHTING.

Alton, Ill.: The Alton Gas and Electric Light Co. will put in an electric plant.——Victoria, B.. C: It is proposed to improve the electric light plant. For particulars, address R. B. McMicking, Superintendent and Electrician.——Kewanee, Ill.: The Kewanee Electric Light and Motor Co. is about to make extensive improvements to its plant.——Fresno, Cal.: The Fresno Edison and Electric Light and Power Co. is about to establish an electric light plant.——Mineral Point, Wis.: An appropriation for electric lights is to be made.——Centerville, Ia.: An incandescent electric lighting plant will be established.——Canton, Ill.: This place has decided to illuminate its principal streets by electricity.——The following electric light companies have been recently incorporated: Henderson Electric Light & Power Co., of Henderson, N. C.; $10,000. Mascoutah Electric Light Co., of Belleville, Mo., George Posten, U. R. Hagist and F. Dilg. McCook Electric Light Co., of McCook, Neb., to furnish arc and incandescent plant; F. Camith, S. W. Duddleston, Geo. Bicknell, J. A. Wilcox; $30,000. Pacific Coast Fuel & Gas Co., of Chicago, Ill.; L. Annison, C. C. March, H. F. Miller; $500,000. Elgin Electric Heating Co., of Elgin Ill.; C. E. Jones, R. V. Botsford and F. R. Aller; $10,000.

SEWERAGE NOTES.

Salem, Mass.: Sewer extensions to Juniper Point and Salem Neck are proposed. Woburn, Mass.: Mr. M. M. Tidd has been appointed engineer by the Sewerage Commissioners. Palmer, Mass.: The new sewerage system is to cost $26,000.——Newport, R. I.: A sewer will be built to Coggeshall ave. at a cost of $50,000.—— Olean, N. Y.: A preliminary report on the proposed sewerage system has been made by Mr. J. A. Seymour, of Bradford, Pa. Sandy Hill, N. Y.: The village trustees have engaged Mr. P. H. Baermann to make a survey fer sewerage.——Vancouver, B. C.: The city has voted to put in a system of sewerage at a cost of $500,000.

WATER WORKS NOTES.

Kansas City, Mo.: An ordinance has been passed requiring the Board of Public Works to make a full report to the council as to the results of its investigations, and those of the board of experts, into the water supply question. The experts have located a site for a pumping station in Clay Co. The estimated cost is expected to be within the $2,000,000 appropriation.—— Baird, Tex.: A water supply is to be obtained from wells 30 feet deep and pumped to a tank of 50,000 gallons capacity. Wind and steam power will be used. The consumption is estimated at 24,000 gallons per day. The work will be done by a company with $20,000 capital stock.——Wichita Falls, Tex.: A water supply is to be obtained from wells.—— Hondo City, Tex.: A water supply company has been organized.—— Northville, Mich.: The town voted on August 31, to establish water-works, but it has not yet been decided whether it will be done by the village or whether a franchise will be granted to a company. G. A. Downes is village clerk.—— West Union, Ia.: A water-works system is projected. —— Tekaamh, Neb.: Mr. LaBelle, of Kalamazoo, Mich., has been appointed engineer to supervise the construction of the new water-works.—— Plymouth, Wis.: The water-works question is being discussed.—— Youngstown, O.: The water mains are being extended to Haselton. The Water-works Trustees are contemplating improvements, including a main to Brier Hill and the enlargement of the Worthington pumping plant.—— North Baltimore, O.: The North Baltimore Water-works Co. has been incorporated. Capital stock, $100,000.—— Toledo, O.: The Water-works Trustees will carry out improvements and enlarge the pumping station to make room for the new engine. The cost will be about $30,000. The engine will be put in this winter, and will have a daily capacity of 15,000,000 gallons.——Duncannon, Pa.: It is reported that water-works are to be established.—— Richmond, Va.: Superintendent Bolling has reported that the best method of purifying the water is to establish a large storage reservoir or settling basin above the pumping station. He recommends the use of meters, with low meter rates.——Wheeling, W. Va.: The Board of Water-works Trustees has reported that a better and larger water supply is needed, with new and stronger machinery to pump water up to the reservoir. The cost of moving the works to a point above the city is estimated at $200,000 to $800,000.—— Great Falls, Mont.: The city limits have been extended and the council has ordered 6½ miles more water mains laid ; 900 feet of 12-inch pipe of the above will be submerged pipe across the Missouri river.—— Santa Rosa, Cal.: An improved and enlarged water supply is under discussion.——Amherst, N. S.: A system of water-works is to be built at a cost of about $80,000. The supply will be taken from the Nappan river.—— Spokane, Wash.: The City Engineer has made an extended report to the Board of Public Works on different systems for the water supply of the city. The estimates are from about $300,000 to $600,000. Capt. Symons is consulting engineer.——Tacoma, Wash.: The special committee appointed last April by the Chamber of Commerce to investigate the water supply has reported that the available supply from Spanaway Lake, Clover Creek and springs in the southern part of the city is sufficient for 150,000 people. The committee reports that the water at its source is of a good quality, but that it is contaminated by being brought to the city through an old flume. A 40-inch steel conduit, at an estimated cost of $200,000, is recommended to replace the present flume.——Plaquemine, La.: The Plaquemine Water-works Co. has been organized. President, J. A. Grace ; Secretary, David Altemus. Capital stock, $15,000.—— Zanesville, O.: The Water-works Trustees have awarded a contract to the Holly Mfg. Co., of Lockport, N. Y., for a new Gaskill crank and flywheel high duty pumping engine of 5,000,000 gallons capacity, for the new water-works extension.——Columbus, O.: The Ohio Water-works Co., of Mansfield, has been organized for the purpose of supplying water from Lake Erie to all the cities from Sandusky to the Ohio river. Capital stock, $10,000. One clause of the incorporation papers authorized the company to acquire existing works by purchase or consolidation, but the Secretary of State refused to grant incorporation unless that clause was omitted.——Bascawen, N. H.: It is proposed to put in a system of water-works at a cost not to exceed $75,000. Water will be taken from Great Pond, and will be supplied to Penacook also.—— Easthampton, Mass.: The town has made an appropriation of $15,000 for pipe lines and for a pumping station near the junction of Rum and Broad Brooks.——Manchester, Mass.: The town has voted an appropriation of $110,000 for water-works extensions.—— Providence, R. I.: The Council has made an additional appropriation of $20,000 for the repairing of the Fruit Hill reservoir. The total cost will be about $95,000.—— New Britain, Conn.: The city will raise $60,000 for constructing a new dam and appurtenances at Shuttle Meadow Lake. It is proposed to obtain power to issue bonds.

BIDS AND CONTRACTS.

Manchester, N. H.: Proposals for electric lighting will be received by the city on Sept. 25. Address the city clerk for particulars.——Seattle, Wash.: Proposals are wanted until Sept. 24, for the erection of a building for the University of Washington. Address Elisha P. Ferry, of the Board of University Land and Building Committee, as above.——Nappanee, Ind.: Proposals are wanted until Sept. 24, for the construction of a system of water-works at this place. Address Perry A. Early, town clerk, as above.——Salt Lake City, Utah: Proposals are wanted until September 22, for the erection of the joint county and city building at this place. Address Geo. M. Scott, chairman Building Committee, as above. — Grafton, W. Va.: Proposals are wanted until October 1, for the construction of a system of water-works. Address Mayor George W. Chambers, as above.——Washington, D. C.: Proposals are wanted until September 23, for the construction of dry-air closets and buildings of the Navy Department. Address N. H. Farquhar, Chief of Bureau, as above.

Durham . System . of . House . Drainage.

Silver Medal Awarded in 1883 to the Durham House Drainage Company, of Chicago.

E. BAGGOT, Chicago.

OFFICE & SALESROOMS: 169 & 171 Adams Street,
BRANCH: 2134 Michigan Avenue, - - -
FACTORY: 367 & 369 Illinois Street, - -

P. V. DWYER & BRO., St. Paul.

DURHAM SANITARY ENGINEERING AND CONSTRUCTION CO., Minneapolis, Minn.

HUSSEY & DAY CO., Omaha, Neb.
HENRY PAUL, Houghton, Mich.
J. D. MADDEN, Fort Wayne, Ind.
J. M. TOYE, Winona, Minn.

Durham System

IN A CITY HOUSE (NO SCALE).

Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E AND G. Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes," those draining other fixtures "waste-pipes."

F AND H. ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

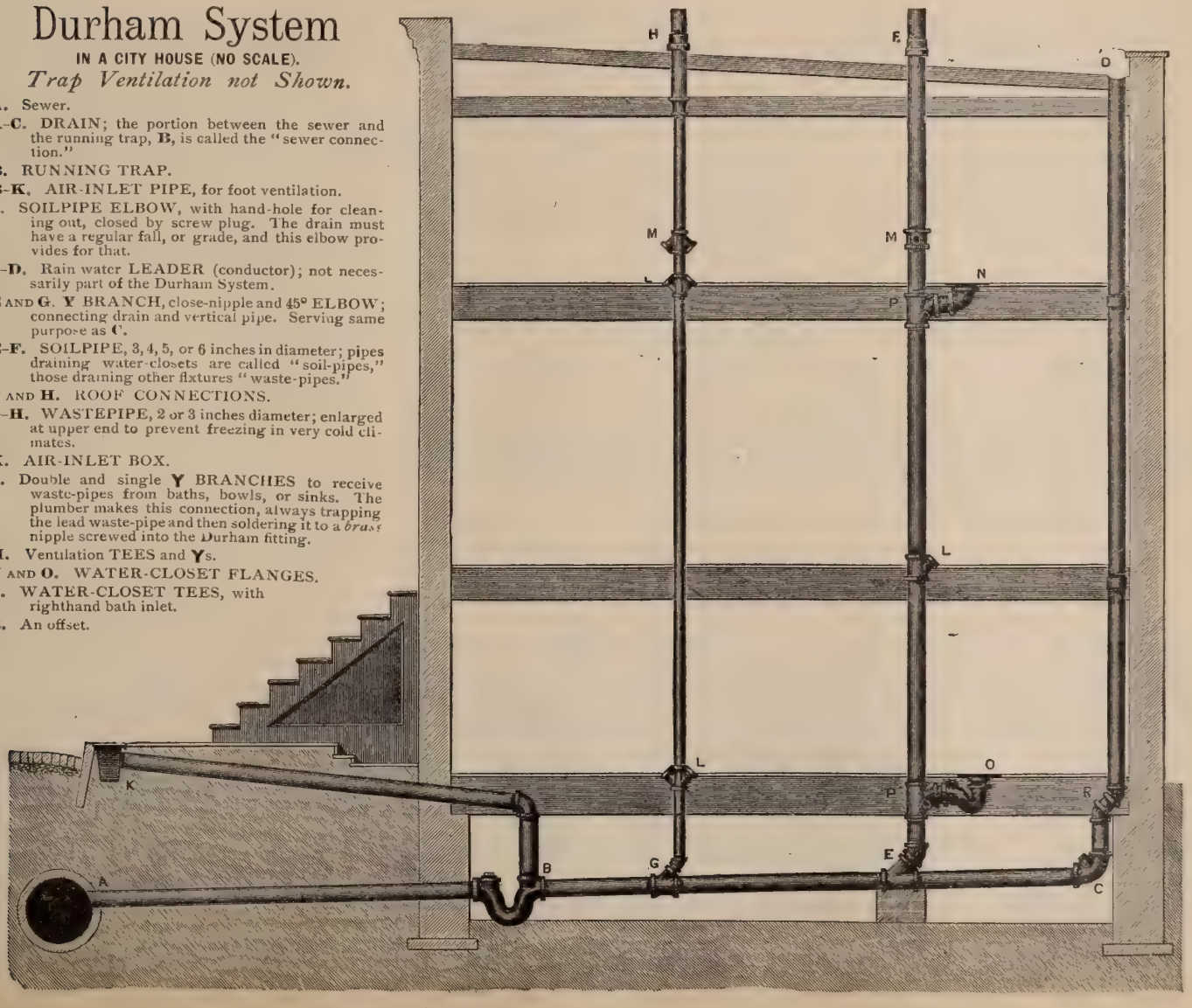
L. Double and single Y BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and Ys.

N AND O. WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



BUILDING PERMITS.

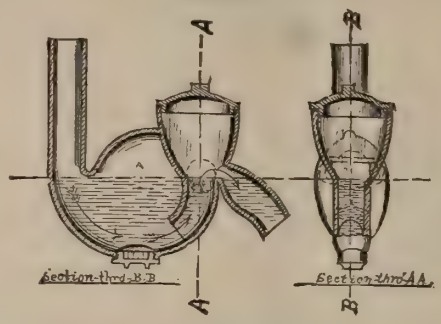
J. C. Hayes, 3-sty and bst brk flts, 24x65, 685 W. Monroe st	$7,000
S. Side Express and Storage Co., 4-sty and bst brk strg wrhse, 48x60, 1523-25 Wabash av; a, M. F. McCarthy,	12,000
Chicago Gas Light & Coke Co., brk tank, 190 ft. in diameter, Cologne nr Deering st.	85,000
South Side Rapid Transit Co., 2 and 1-sty brk strs and wtg room, 40x85, 76-78 12th st	12,000
J. Ogden Armour, 3-sty and bst brk dwlg, 43x82, 3720-24 Michigan ave; a, L. B. Dixon	80,000
John A. Lynch, 3 2-sty and bst brk dwlg and brn, 42x64, 562-66 N. State st; a, Jenney & Mundye	100,000
Miss K. M. A. Weber, 3-sty and bst brk flts, 25x68, 366 Mohawk	8,000
C. A. Kruschinsy, 3-sty and bst brk str and flts, 22x55, 624 Turner ave	7,000
J. L. McClure, 6 4-sty and bst brk strs and flts, 122x49, 430-44 35th st; a, F. B. Townsend	35,000
Barbara Kalal, 3-sty and bst brk flts, 24x60, 498 Winchester ave	7,000
John Smith, 3 2-sty and bst brk dwlg and brn, 32x68, 3806-08 Michigan ave; a, I. I. Beman	25,000
Patrick Walsh, 3-sty and bst brk flts, 24x65, 1239 Blue Island ave	7,000
Johnson & Beilman, 2-sty brk str and flt, 25x 68, 2490 W. Lake st	6,000
Benton Sturgis, 3 2-sty brk strs and flts, 81x 79, 1801-07 Wabash ave; a, Thomas Hawkes	15,000
H. W. Arnis, 4 1-sty frm cttgs, 20x48, Tripp st, nr Armitage ave	6,000
J. H. Lathen, 3-sty and bst brk flts, 22x64, 362 Bissell st	6,000
John Doyle, 3 sty and bst brk str and flts, 260x 55, 1209 Van Buren st	5,500
J. H. Ohler King, 3-sty and bst brk str and flts 24x100, 692 W. Van Buren st; a, Charles Th'sslen.	14,000
J. A. Ward, 4-sty and bst brk flts, 25x80, 430 Oak st	10,000
Dan'l Butler, 2-sty and bst brk flts, 24x50, 535 Claremont ave	5,000
Wm. Evers, 3-sty and bst brk flts, 22x66, 61 N. Hamlin ave	5,000
Mrs. Virginia Garland, 3-sty and bst brk flts, 33x83, 2411-13 Prairie ave; a, J. A. Theine	15,000
David R. Breed, 6 3-sty and bst brk dwlgs, 116x50, 251-63 Belden ave; a, H. M. Hansen	27,000
James Judge, 4-sty and bst brk str and flts 25x63, 362 Van Buren st; a, Wm. Walters.	12,000
Chas. Grieve, 3-sty and bst brk str and flts, 25x82, 3158 Wentworth ave; a, Park & Fuller	6,000

THE E. E. SCOTT PATENT TRAP.

LEAD

FOR

Wash Basins,
Bath Tubs,
Laundry Tubs,
Sinks, etc.



Seals with or without Water.

Scientific in Construction.

This is the latest and most perfect improvement for the purpose and for practical use and durability. Has great advantages over all competitors. The construction is such that a direct pressure is secured from the inlet to the outlet without any obstructions or sharp turns, thus obviating any chance for the lodgement of sediment or the collection of lint or other substance to obstruct the passage. The bottom is the same size as connecting pipes and the sides convex, making it the best trap to scour and clear itself now on the market.

It is sealed at the outlet when not in operation by a non-corrosive ball, which, when the trap is in operation, is kept in motion by the water and prevents anything from collecting on the inner side of the ball chamber. The outlet does not project so far into the trap as to allow the sediment to miss the outlet and clog above it or around the inlet, as is the case with most other traps. In this the direct pressure obtained through the body of the trap, which has the air chamber above the water line, thoroughly cleanses it whenever flushed, and carries all refuse matter up under the ball into the outlet.

It remains securely sealed at all times, whether it contains water or not, because when not in operation the ball must rest securely in its seat, effectually closing it against the escape of sewer gas.

The mouth of the outlet pipe leading out of the ball chamber is oblong, having its greatest diameter in a horizontal plan and a capacity equal to the inlet, and hence much less pressure is required to raise the ball far enough to allow the water to escape than in other traps having the mouth of the outlet pipe round.

1¼ Lead Trap, List, $1.40 with Ball. 1¼ Lead Trap, List, $1.00 without Ball.

Liberal discount to the trade.

Manufactured and Sold by E. E. SCOTT & CO., 115 South Jefferson Ave., East Saginaw, Michigan.

W. C. URQUHART,

Maker of

PLUMBERS' SPECIALTIES

Tanks, Seats and Earthenware.

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The Germo Proof Water Purifier

SIMPLE, DURABLE, PERFECT.

The most practical Filter for household purposes ever put on the market.

FAMILY SIZE PURIFIES 48 GALS. PER 24 HOURS

PRICE. $4.50.

Agents wanted everywhere. Correspondence solicited.

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In Use in all the States from Washington to Maine.

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Will Melt 10 Lbs. Solder in Six Minutes.

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FOR WATER, GAS AND STEAM.

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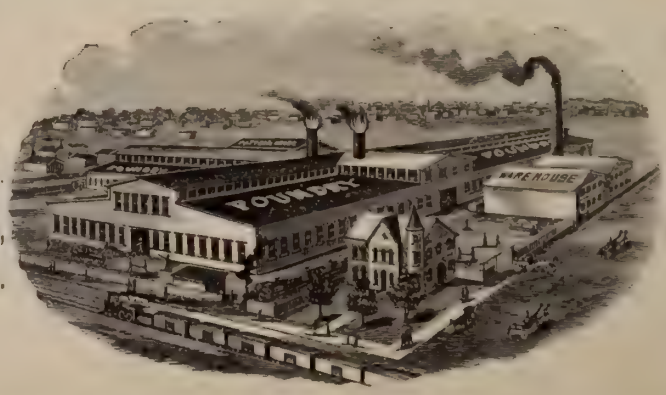
OFFICE: 327 & 329 W. MAIN ST. Louisville, Kentucky.



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Persons so desiring may have replies to small advertisements sent to this office, when they will be promptly forwarded to the advertiser free of charge.

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LONDON OFFICE.

Copies of this journal may be found on file at the office of its London agent, Mr. Henry R. Allen, 50 Finsbury Square, E. C.

BOUND VOLUMES.

A few complete sets of THE SANITARY NEWS, from the first issue, are stil left. The price of these is $2.00 a volume, except for the first volume, which is $3.00. The entire fifteen volumes constitute a valuable library on sanitary subjects.

COMMUNICATIONS.

Address all communications to THE SANITARY NEWS, 90 La Salle Street.

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DR. HENRY B. BAKER, ex-President of the American Public Health Association, has joined Dr, John Rauch in a movement to have the International Congress of Hygiene hold its next meeting in Chicago in 1893. The last congress was held in London this year. While there were several delegates present from the United States they were not authorized to invite the holding of the meeting in this country. It was voted that it should be held in Buda Pesth in 1894. Mr. Baker thinks that the permanent committee could be induced to postpone the Buda-Pesth meeting until 1895. The congress includes in its membership all the distinguished sanitarians of the age.

* * *

IT IS well for sanitarians to begin now to make arrangements for the World's Fair. They can hold a meeting then, and much good can be accomplished. Not only will there be the sanitarians of the old country over, but there will be a better representation from this country. With the sanitary exhibits present, they can have a better time to discuss the present than any other occasion will permit.

* * *

IF there is any new plumbing to do, take into the job the latest and best approved appliances. Do not let the old styles hang on on account of their long use. Be in plumbing as with everything else. Go for the best to your fullest extent. If the architect wants to stand where he will be respected for his skill, let him not stand in the way of any new appliance that has merit and recommends itself.

* * *

THERE is no one better calculated to win the approbation of mankind than the plumber. He is absolutely where he can give value received, and that is what every one wants. Let him go to work from this time on working for the best in plumbing, and see how soon he will be the only one employed, where a good healthful home is wanted.

CRIMINAL PLUMBING.

We reprint the following from the Philadelphia *Times*, as it seems an honest effort to bring about that standard in plumbing which THE SANITARY NEWS has been laboring for. It can well be read with profit by many, and will show to all what may be expected of them in the near future:

It is only now and then that some accidental revelation exposes work of the criminally careless or incompetent plumber. Sometimes it is fatal diseases in families which lead to critical examination of his work and in rare cases the official inspectors of buildings detect it; but it is a fact known generally to physicians and to all who have given the subject careful study, that one-half or more of the fevers and other malerial maladies which are so common in Philadelphia are the logical results of the criminal plumber.

In point of fact the sanitary plumbing proclaimed and professed to be practiced by the organized Master Plumbers is seldom enforced. The keen competition in trade compels active underbidding for work, and that causes plumbing contracts to be taken at such low prices that the contractors must choose between doing bad work where it is concealed, or losing money on the contract. Few are willing to do good work at less than its actual cost, and plumbers are eminently human in that regard. Most of their work is hidden from ordinary notice, and they largely make their profits by dishonest practices.

The one part of the residence that should not be offered to competition by contract is the plumbing. Only the most experienced, skillful and honest men should ever be employed to do the plumbing in a home; and then it is safest to watch it with care. The ignorant or dishonest plumber will sow the seeds of death in every home if he is allowed to do the plumbing, no matter how well he is watched or paid; and the only safe rule is to employ thoroughly competent and honest men, to pay them fair prices for their work and then require them to guarantee it for five years subject to semi-annual tests. This rule would be likely to assure first-class plumbing and it would drive the incompetent and the criminal plumbers out of the business.

There is no excuse for ignorance of poisonous gases in a home. The integrity of the pipes can be as easily and as certainly tested as the leaks in a roof when it rains. By closing the

pipes and applying sulphur vapor under pressure, it will not only find every imperfection in the plumbing, but it will declare the exact point of the defect alike by its visible color and by its odor. If it enters the house anywhere, it at once exposes the negligent, incompetent or criminal plumber. This test, or some one equally effective if there is such, should be applied to each home at least every spring and fall, and it should be a part of the plumber's contract to repair for a term of years all defects thus exposed at his own cost.

The plumber who deliberately puts imperfect work in the hidden parts of a house, and thus exposes a family to disease and death, is as much a criminal as any burglar or murderer. He knows that the diffusion of poisonous gases destroys health and imperils life, and when he deliberately leaves hidden vents in plumbing for sewer gas to carry its deadly fumes into homes, he is a criminal and he should be treated and punished as a criminal. A recent report of the official inspector of House Drainage, wherein he reports the plumbing in a house as "done in the most incompetent and dangerous manner," offers an opportunity for the Master Plumbers to begin by dismissing the criminal plumber and demanding his prosecution for his crime. The criminal plumber can be driven out of business if the people act with common fidelity to themselves, and it is high time that the good work should be begun in earnest.

"INTRODUCING YOUR GOODS."

Having just read an article by Mr. Jno. K. Allen touching the above subject, we are led to comment on it to some little extent. THE SANITARY NEWS is a paper published for the good of plumbers, architects, engineers and manufacturers of hot water, steam, and furnace heating, ventilation, lighting, sewer builders, waterwork contractors, etc., and feels that it has some claims upon them for their advertising patronage. Mr. Allen thinks not, but we believe a few words from us will convince him that we do.

In the first place THE SANITARY NEWS is published weekly. It is published in such a manner, with such a class of reading matter, that it is bound, in accordance with the indices which are published and sent out with each volume, by many. Many others keep it, and if they miss a number, are careful to send for it, showing what is thought of it. Coming once every week, being full of good, interesting, instructive reading matter, it is the journal in which to advertise. It is the only journal of its class published weekly, and for that reason it stands alone and paramount above all others. The manufacturer or dealer who understands the value of reaching his patrons weekly, will understand the importance of placing his advertisement in a journal of that class. If we will go back to the Cincinnati convention, which was held June 23, 24 and 25, we will find that *Domestic Engineering* was July and August publishing the account of it, while THE SANITARY NEWS published a good reliable report of the convention that week and the next. Suppose you once look at reaching the plumbers and your patrons but twelve times a year, and then think of reaching them fifty-two times in the same period, which would you prefer? If you wish to sell goods you will reach them fifty-two times. Every issue of THE SANITARY NEWS contains more reading matter than *Domestic Engineering*, and when you consider that it is published fifty-two times a year to the other journal's twelve times, you will see the vast additional matter you receive.

Another thing is worthy of notice: THE SANITARY NEWS has at its head in active duty as president and general manager, a practical plumber. Andrew Young, the general manager of this journal, has been honored by the master plumbers of Chicago to the election of president three times by them; honored by the plumbers of the country by being elected the first Vice President and the second President of the National association. He stands to-day with this paper in his hands, speaking to a larger class of readers than can be found on any other paper of its class.

We have no fault to find with Mr. Allen or his paper, but do not mind comparing them when he so openly suggests it. How he can see that his paper is the one in which to advertise is plainly enough to us, but we think he will find that the majority of the manufacturers and dealers will find that THE SANITARY NEWS is just as good as his. If there is anything about the numbers of times issued, we could see how they would conclude that THE SANITARY NEWS is the best; and that there is all in the number of times each is published, there can be no doubt. If there be anything in what papers contain, the decision would naturally be much more favorable to THE SANITARY NEWS. If there be anything in regard to papers in any shape or form, the decision would be highly in favor of THE SANITARY NEWS.

We will ask our patrons simply to look the two papers over, consider one is a few days old and the other a few weeks, and leave them to decide which one should have the patronage. If people should wish to sell goods only once a month and no more, then it would be a good thing to advertise in the monthlies; but if they want to sell goods about all the time, it will do them the most good imaginable to advertise in the weeklies. It is not necessary for us to tell which papers are best to advertise in. We only mention the facts and let you alone to select the papers you want.

NOTES AND NEWS.

The great lick telescope reveals about 100,000,000 of stars, and every one of them is a sun, theoretically and by analogy giving light and heat to its planets ; this telescope reveals stars so small that it would require 30,000 of them to be visible to the naked eye.

Four different mountain peaks in Idaho are from 13 to 23 feet lower, by actual measurement, than they were fifteen years ago, and it is believed that this settling is going on with many others. The idea is that quicksands have undermined them.

The works of watches are now plated with palladium, which is a whiter, lighter and more fusible metal than platinum. About one-seventeenth of a grain of palladium will, by electrical deposition, coat the works of an ordinary watch.

At Waltham a single pound of steel costing 50 cents is manufactured into 100,000 screws, which are worth $11. They look about like iron filings, and it needs a microscope to distinguish them as screws.

A velocity as high as 2,887 feet per second has been attained by a projectile from a rapid-fire gun. This is at the rate of 1,968 miles an hour. It is the highest velocity yet recorded.

The first steel car built for postal purposes was run 270,000 miles, and went through five smashups at a cost of $42 to the company for repairs.

Mexico has a rock that serves as a weather prophet, by changing color with every approaching change in the weather.

The peach was originally a very poisonous fruit, but by cultivation the poison has disappeared.

A boat made altogether of the new metal aluminum has been recently built and launched in Zuric, Switzerland. It is only twenty feet long and will be exhibited at a Frankfort marine exhibition merely as a miniature of the ship of the future. It is run by a two horse-power naphtha engine, and its hull, screw and machinery are all made of aluminum. The little craft is entirely successful from every point of view.

Georgia is going to tax bachelors. A bill for that purpose has been brought into the Georgia Legislature and the House Committee on hygiene and sanitation has reported it favorably. Under its terms it will cost a Georgian $25 to begin the bachelor business at thirty years of age, and on a rising scale of $25 for five years a man of sixty and over will be at the expense of $200 per annum for the privilege of going without a wife.

A new style of garbage wagon was examined to-day by Health Commissioner Wingate and other city officials, and one of the wagons was taken to the foot of Biddle street and given a practical trial. The wagon box in which the garbage is placed is made of steel and is air-tight, so that bad smells cannot emanate from the load. There is an attachment for removing the garbage that thoroughly cleans the box. Dr. Wingate will recommend that wagons of this kind be used by the city, instead of having the garbage collectors furnish their own vehicles, as they do now. About forty wagons are required, and if the city furnishes them the collectors agree that they will work for 25 cents per day less than at present.

If the method of charging cotton seed oil with lead, which is said to have been discovered, is found practicable, the value of

that abundant product will be greatly increased. The process as at present defined is of the utmost simplicity. One gallon of pure cotton seed oil is placed in a suitable iron vessel, into which 20 pounds of molten lead are poured. After a thorough stirring the lead separates into globules, and when the oil has been poured off, after cooling, there is found to be about 17 pounds of the lead, the remainder having been absorbed by the oil. On the lead being melted, and the operation repeated to the fifth pouring — the amount of lead absorbed being less at each succeeding pouring — the total amount of lead absorbed is about ten pounds The oil thus charged with the lead is then used as a paint, being applied in the ordinary way to metallic surfaces. It is claimed that this liquid, which adheres closely and becomes very hard, is especially useful in protecting metal from oxidization or corrosion.

THE EDUCATION, POSITION AND DUTIES OF PLUMBERS.

The following is taken from the *Plumber and Decorator* of London:

THE EDUCATION OF THE PLUMBER.

The education of the plumber presents peculiar difficulties. In common with other lads of the artisan class, those who enter the plumbers' craft generally leave school at a very early age, and by the time they are old enough to value the instruction they have received, or to wish to continue their education, they have forgotten most of what they were taught.

Besides this the instruction given in primary schools is generally of such a character that the average lad sees very little connection between what he has been taught in the school and what he requires to know in the workshop and for the actual exercise of his calling.

To most lads the break between the school and the workshop involves a complete discontinuity. There seems to be no common thread running through both school and workshop teaching and connecting the life of the two.

But, while we may confidently hope that a better elementary training will be given to future generations of apprentices, it must be our immediate concern to meet the requirements of those who now fill our workshops, and, for the reason referred to, it becomes necessary that the technical class should encroach to some extent on the functions of the elementary school. Hence, not unfrequently the teacher of plumbing has to take his class through a short course of workshop arithmetic including vulgar and decimal fractions, square root, duodecimals, etc., with special reference to the calculation of areas, volumes and weights. A little practice in freehand drawing, particularly in making dimensioned sketches of apparatus connected with the plumbers' craft, is very desirable, while it is of still greater importance that the apprentice should be taught how to "read" a working drawing with the meaning of plan, elevation, section, etc. Having mastered these elementary principles, he proceeds to practical applications of his knowledge. He need not learn how to draw the development of the surface of a truncated prismoid, but he should be taught to mark off the lining for an oblong sink with sloping sides, which is precisely the same thing under a different name. The elements of mechanics, including strength of materials, of hydrostatics and hydraulics in their application to water seals, the flow of water in pipes and other every-day problems, the effects of heat and cold on water and on lead, the chemistry of air, water, lead, zinc, iron and copper, and the action of fluxes in soldering, the nature of combustion and respiration, the principles of ventilation, and the character and mode of propagation of zymotic diseases are all items of scientific knowledge, which the plumber cannot afford to neglect.

The science subjects required by the plumbers' apprentice may therefore be enumerated as mathematics, practical geometry, machine drawing, theoretical mechanics, applied mechanics, inorganic chemistry, heat and hygiene, and to these may with advantage be added, electricity and freehand drawing; and when he has mastered all these, there remain the applications of the scientific principles to the practical details of his craft.

A well-trained engineering student who is a candidate for a Whitworth scholarship is able to gain a fair knowledge of a number of sciences such as those above enumerated through the aid of ordinary science classes. But Whitworth scholars do not form the rank and file of engineer apprentices nor are students of such exceptional ability very common in plumbers' shops. Moreover, in order to gain such a knowledge of hydraulics as would be of most value to the plumber, he would, in the ordinary course of scientific training, be obliged to study mathematics of a high order, while the greater part of his reading would appear to have no direct bearing on the practice of his craft. It is, therefore, not surprising to find that attempts to teach plumbers side by side with apprentices belonging to other trades in ordinary science classes have not met with encouraging results. The only satisfactory method consists in teaching the plumbers most of what they require to know in a class by themselves, illustrating every scientific principle by examples derived from the plumbers' everyday work, and to the majority of the apprentices giving instructions only in those parts of a science which are immediately applicable to the practice of their craft. It must be admitted that such a training is not an education of a very liberal character; but, if properly conducted, it is education and not cram. There is no reason why a lad's powers of observation and of reasoning should not be called into play as well by the study of special branches of half a dozen sciences as by his more thorough devotion to all the branches of one or two. Of course, it would be more satisfactory if all the sciences touched upon could be mastered systematically and thoroughly, but an apprentice's life is short, and when from that life there are deducted between 50 and 60 hours a week for the workshop, the hours available for study are very few.

We conclude, then, in the first place, that plumbing apprentices should receive nearly all their training in classes by themselves, and that the teaching provided should be especially adapted to the requirements of their craft. On this account very little assistance can be obtained from the science and art department, and it is to those funds which are especially set apart for technical instruction that we must look for aid in providing the education required by plumbers' apprentices.

Only the winter evenings are available for class work, and it therefore becomes necessary to extend the course of instruction throughout the whole term of apprenticeship. On so long a road it is necessary that some milestone should be placed to encourage the traveler and mark his progress. To this end the Worshipful Company of Plumbers have drawn up a graded syllabus of instruction corresponding to preliminary, intermediate and final courses, and has arranged to conduct an examination at the end of each course, and to give a certificate to all who satisfy the examiner. There will thus be three grades of certificates for journeymen and apprentices, and those who satisfy the examiners in certain additional subjects in the final examination become eligible for a master's certificate; making four grades of certificates in all. At the end of his first or second year of apprenticeship the young plumber should obtain the preliminary certificate. This marks a certain standard of efficiency, and he will not again have to pass an examination in the more elementary subjects of the preliminary course. Such a certificate should have a commercial value as indicating on the port of the holder both capacity and industry. A year after taking the preliminary certificate, the intermediate examination should be passed and the second certificate obtained. At the end of his apprenticeship the young improver should be able to pass the final examination, on the result of which the certificate of registration is given with the title of registered plumber, and in certain cases of Honor men the Freedom of the Plumbers' Guild of London is granted in addition. The graded syllabus of instruction and the examination questions set last May for the preliminary certificate are appended to this paper.

The next question is the character of the teacher, and it may be assumed that it is very undesirable to employ a large number of teachers for one class of students. A practical plumber holding a high position in the estimation of the local trade and possessing thoroughly scientific knowledge and the power of imparting it, is far the best teacher, and where such a man can be found his services should, if possible, be secured at any cost, and utilized to the utmost in the conduct of as many classes as possible in the more important towns of the district. Unfortunately, men possessing these qualifications are very difficult to find and still more difficult to secure for educational purposes, and, when they

are not available, the best substitute is an experienced teacher of considerable scientific attainments, who has had some experience of workshop life, who understands the habits and modes of thought of artisans, and who will take the trouble to learn the nature of the work which the plumber has to carry out, and the conditions which determine its efficiency. A teacher who has so far mastered mathematics and mechanics as to be able to put the most advanced conclusions in the simplest form, who has a sound knowledge of physics and chemistry, and who has had some training in an engine works, or in any other mechanical trade, may, by the careful study of such works as those of P. J. Davies, J. W. Clarke, S. S. Hellyer, W. P. Buchan, W. R, Maguire and others, and by keeping his eyes about him, readily fit himself to teach all that is required, except workshop practice. This last must, of course, be dealt with by a practical plumber, and it is very desirable that the whole course of instruction should be under the general direction of a committee of plumbers. If within the next few years classes for plumbers are to be conducted at all commensurately with the requirements of the country, the provision of normal classes for teachers in two or three important centres, where special facilities exist, should at once engage the attention of Local Authorities.

It may be asked whether the methods here advocated should be followed in providing technical instruction for those engaged in all other mechanical industries. In reply, it may be stated that it is both unnecessary and impossible to provide such instruction for all the rank and file of most trades. The plumbers position is exceptional on account of (1) the great degree of individual responsibility resting on the ordinary journeyman; (2) the enormous public interest involved.

(Concluded next week.)

S. E. THOMAS TRAP.

In compliance with your request, I have pleasure in enclosing illustrated price list of my "Star" traps and will send at once electrotypes of the different styles for publication in your valuable journal in the manner you suggest.

No. 1.

No. 2.

In setting forth the merits of these traps I may say that my opinion is, that a trap, non-vented, can be siphoned no matter of what make or construction, provided it is subjected to sufficient vacuum suction.

In regard to my non-vented traps, Nos. 1 and 2 I claim that owing to their holding a very large body of water they are less likely to siphonage under ordinary circumstances, and in ordinary use than any pipe-trap made that is used without being vented.

And in addition to this very important feature my No. 2 trap, owing to its construction, has a large air chamber above the outlet line that very naturally prevents siphonage.

My No. 3, or vented pipe-trap I furnish with vents, either open ready for use, as per illustration, or closed with brass caps. Of course if the vent is used it is absolutely impossible to siphon the trap, and if the vent is closed as described there remains a large air chamber which as I said will to a great extent prevent siphonage. There are other very important features in connection with these traps in regard to durability, etc., but as I understand this discusion is confined to the subject of venting and siphonage, I will conclude by saying that my traps are as near non-siphoning as it is possible to have any trap without being vented.

Very truly yours,

S. E. Thomas.

SEWAGE DISPOSAL.

In the Chemical Section of the meeting of the British Association at Cardiff, Mr. C. G. Moor read a paper on "A New Method for the Disposal of Sewage, with some references to schemes now in use." The author remarked that at the recent Congress on Hygiene and Demography, Dr. Thresh asked, with reference to sewage treatment, if any of the processes mentioned enabled them to get rid of their sewage in such a way as to give rise to no nuisance and cause no danger to health, at a cost sufficiently reasonable, considering the importance of attaining such results. In the opinion of most experts of the present day the only answer was a direct negative. That could be seen from a brief consideration of the methods now in use — lime processes, other than lime processes, and irrigation. In the first of the three a good effluent was the only thing aimed at, as the sludge was worthless. In the second, the sewage matter was precipitated by various preparations, and the deposit of sludge was often of some value as manure, whilst there was also an electrical treatment. With regard to irrigation, that might be adopted with success where land was suitable and cheap, but it was a disputed point as to whether parasites might not be communicated to the animals feeding from the crops raised off unfiltered sewage, and it was certainly not advisable to irrigate fields with untreated sewage, so that pools of putrifying matter were formed, round which cattle were feeding. The treatment referred to in the title of the paper had been practically tested at experimental works at Leyton. He had no very novel suggestions as to the precipitation of sewage, the originality of his method depending on the manner in which the sludge cake, produced by any precipitation process, might be converted into marketable products. Sludge cake consisted, roughly speaking, of 25 parts water; 20 parts inorganic matter, containing phosphates; and 55 parts combustible matter, containing nitrogen. If they could afford to distil the coke in gas-retorts they would save the ammonia, but it would not pay to do that unless it was very rich in ammonia, and then it would be salable without further treatment. There was, however, a cheaper way of distillation in a patent obtained some years ago by Mr. Rees Reece, in which a kind of lime-kiln with a forced draught, connected with a series of condensers, was used. He had used the same method and had experimented on a sufficiently large scale to show the possibility of practical working. The sludge gave ample heat for its own distillation, and might also be used to raise steam in the same furnace if desired. Eighty per cent. of ammonia was what he actually obtained, and probably more could be obtained with better apparatus. The low value of the ash, which contained about 60 per cent. of calcinna salts, was due to the addition of the lime for precipitation and pressing. The lime also produced clinkers in the furnace when at the temperature at which point inflammable gas is produced. Where clinkers could be used that might be done, and the ammonia alone relied on as a source of income. The uncondensed gases, having an unpleasant smell, must be burnt to avoid a nuisance. What was wanted was to produce a sludge cake rich in ammonia and phosphate, without adding precipitants in such a quantity as to lower the percentage of phosphate in the ash. The use of lime ought to be avoided at all costs, and he should be inclined to try carbonised sludge in powder mixed with salts of alumina and iron, and after precipitation running the liquid through a bed of lumps of carbonised sludge, which could be burnt when foul. It seemed probable that by using a sufficient quantity of that carbonaceous material (which could be so readily renewed) a considerable degree of purity could be arrived at in the effluent. At the present day it was fast becoming widely felt that it was the duty of towns to treat their sewage in some way so that no injury might be caused to health, but yet they ought not to rest content with processes that yielded nothing but refuse. It was now many years since Liebig insisted on the need of maintaining a proper circulation of phosphates and ammonia if they wished their land to remain fertile, and that need, instead of diminishing, showed itself more clearly every day.

CONVENIENT TO HAVE ABOUT.

To freeze one pound of water by compressed air would require 81 cubic feet of air at 60 degrees, compressed to a pressure of two atmospheres, therefore, the power required to freeze one

pound of water by the use of compressed air would be 1630 times 81 which equals 132,030 foot pounds of energy.—*The Weekly Stationary Engineer.*

To compress one cubic foot of air at atmospheric pressure to one-half its bulk requires an expenditure of 1630 foot pounds.

The law of evolution works in language as well as in other things. Twenty thousand words have been added to the English language in the department of biology alone since Darwin's discoveries.

The *Chronique Industrielle* gives the following receipt for taking off rust. Cyanide of potassium 15 grammes (one gramme =14½ grains); soft soap, 15 grammes; whitening, 30 grammes; sufficient water to form the ingredient into a paste.

A high pressure engine runs by the direct pressure of the steam only. In a low pressure engine the steam is condensed with water or otherwise, and a vacuum formed in front of the piston, adding from 13 to 14 pounds per square inch to the power of the piston.—*American Engineer.*

Experiments have recently been carried out in Belgium with respect to the illuminating powers of lamps of the Whenham type and the German type invented flame. It has been shown that the Whenham and Gaso Multiplex lamps are slightly superior to the Westphal, Siemens, and Sylvia lamps.—*Invention*, London.

A mixture for engraving on steel is made of—Sulphate of copper, one ounce; sal ammoniac, one-half ounce pulverized separately, adding a little vermilion to color it, and mix with an ounce and a half of vinegar. Rub the steel with soap, and write with a pointed piece of iron wire dipped in the mixture. It is obvious that the writing tool must cut or scratch through the covering of soap so that the mixture can attack the surface of the steel.—The *Machinery Market*, London.

Thomas Harrington, of Pittsburg, Pa., has been experimenting as to the properties of and uses of nickel steel and manganese bronze, and the result has been the discovery of a new metal, the chief characteristics of which are that it obtains a very high tensile strength, is indestructible by corrosion, being impervious to acids, and can be wrought into spikes, nails, etc., while either hot or cold.

A good many people are unaware that oilcloths, and especially linoleum, should never be scrubbed with a hard brush. Neither should hot water or soda be used. The best way is to wash them with warm water and ordinary yellow soap, and wipe thoroughly dry. Once and again it does good to rub them over with a mixture of linseed oil and vinegar, after they have been well cleansed, or they can be considerably brightened by a simple application of milk.

In places where it is suspected that this dangerous element is present, it would be well to hang a disc painted with pure white lead, having across it a band of silicate white paint, say "Charlton white." The gas, if present, will certainly discolor the white lead, but will not effect the silicate white, and thus the discoloration of the lead will be quickly and easily observed.

An expert in such matters says he has found the following the best thing he has tried for making joints against fluid pressure: Five pounds Paris white, five pounds yellow ochre, ten pounds litharge, five pounds red lead, four pounds black oxide manganese. The whole is to be well mixed, and a little asbestos and boiled oil added. This, he says, soon becomes nearly as hard as the iron itself.

COMBUSTION vs. THE SMOKE NUISANCE.

BY ANDREW YOUNG.

Importers Record says, some years ago a wealthy manufacturer in the West employing nearly 1,000 hands, established a model city, thus giving the workmen and their families many comforts and luxuries that they could not have attained unaided. Of course there were regulations for the government of the model city, and there were fault finders; there was one especial fault-finder of the name of Bascomb. Among the rules laid down for the government of the city was one forbidding the burning of soft coal on account of the smoke; to this Bascomb objected strongly.

"My goodness," remonstrated a friend, I do not see what you are grumbling about, we get hard coal at cost, you ain't out of pocket."

"Tain't no right to forbid it," asserted Bascomb.

"See here," demanded his friend," do you want to burn the nasty stuff?"

"No, I don't wanter," Bascomb replied, "but I want to have the right in case I wanter."

Yes, Bascomb wanted his rights; every man who now thrusts smoke from his chimney into his neighbor's office, or into the rooms of a hotel, into the very bedroom of his neighbor's wife or daughter, or upon his linen and upon the fine raiment of the ladies that make glad our eyes as we walk the streets, wants his rights; the right to smudge every one within range of their chimneys with smoke, to blind their eyes with grit, to make impure the air that they breathe, with noxious gases; to imperil their property with the sparks they thrust out with smoke and unburnt gases from their chimneys.

The rights of every man should terminate where the rights of every other man begins.

The right of man to breathe pure air is given by God; it is the right of man, rich or poor, to say: You shall not pollute that which the Almighty has made necessary to my very life.

It is not the right of steam-makers, engineers or manufacturers to contaminate the air with the wasted constituents of the coal that should have been used in their furnaces to make heat. It is not the right of a fireman, an engineer, or other employe to contemn economy, and exult in self asserted right to burn their coal as they please.

The world owes much to the steam-makers, the engineers and the manufacturers of the world; we are in touch and sympathy with everything that interests them, that effects them, and we propose to stand by them and assert their rights. But there are not a few who, like Bascomb, are unreasoning, opinionated, jealous of their rights, fearful of any one trenching upon their preserves, and not infrequently so stuck up in set ideas, that, like the laws of the Medes and Persians, they are unalterable, with set opinions as to matters necessary to them in their calling to know, in which they have not time for study, and about which they have not time for study, and about which they will not learn when taught.

There is no industrial nuisance equal to the smoke nuisance. Its growth in every city is proportioned to the enterprise of the capitalists; but capitalists have not had time to study all the conditions necessary to perfect combustion; manufacturers have not the time for such studies and experiments; employes have not the means or opportunities to do all this, hence empirical devices and inventions have been imposed upon them by the thousand, adventurers have floated companies and sold shares, then passed to new fields abandoning and neglecting the essentials to the successful utilization of the inventions, causing annoyance and disgust to the men who have permitted the use of their boilers and loss to the men who invested their money, making the very words "smoke consumer" a cause for sneering.

Nevertheless the principles of perfect combustion were long ago demonstrated in the laboratory, and the same is possible in the engineering world; the perfect burning of soft coal will yet be required at the hands of every fireman, and every engineer will be made responsible for the smoke that he permits to pass from his smokestack or chimney; under some conditions of construction they will not be able to prevent the issue of smoke, but the requisites in construction to facilitate perfection in combustion will become the study of every builder and designer in engineering; devices that aid nature in improving the combustion with a view to the prevention of smoke will be a part of every specification; then will the employer have the right to say to his employe, as some may say even now:

"I require to know why there is so much unburnt coal and cinder amongst the ashes."

"I require to know why you make smoke."

"I require to know why you do not make and keep your steam ready all the time without making smoke."

"I require that you send neither smoke nor grit nor sparks out from that chimney or smokestack."

"If you cannot or will not make and keep steam steady all the

time without making smoke and without leaving unburnt coal and cinder in the ash pan, then I will find some one who will."

Prejudice is the womb of injustice, and the many disappointments that have attended everything under the title "smoke consumer" are responsible for prejudice and much delay in getting before the public inventions of real merit; but some of the disappointments have been self-inflicted, or employe-inflicted, by reason of a disposition to kick on account of previous disappointments with inventions into which they lacked the experience to examine before use; or by pure cussedness; or by neglect; or by reason of the men upon whom the use of the contrivance devolved not being pap-fed; therefore it is incumbent upon employers not alone to make sure of the construction of their furnaces, and to bring into use the best appliances for aiding combustion, but to inflict upon their employes the requirements indicated; then will the perfect burning of soft coal without throwing out from the smokestack either soot, smoke, grit or sparks be a *sine qua non* to the employment of both firemen and engineers.

Without such interest taken by builders and designers of boilers, and without such injunctions from employers to employes the latter as doubting Thomases, or from malice, or from desire to make the payment of boodle a voluntary condition precedent to the successful introduction of valuable improvements, may effectually bar the way to success or make success most difficult of attainment. There is nothing so good nor so great as to require 100 men to move it one inch, that one fool cannot destroy.

Engineers sometimes defy laws enacted for the benefit of the general public, to protect the community from smoke; they sneer at every contrivance for the abatement of the nuisance, and do nothing themselves in mitigation of the dirt that they throw from their smokestacks; some even think it a privilege to be able to make smoke; like Bascomb, they don't want any interference with their rights to make smoke if they want to.

A contrivance was put into one of the finest steamers that sails the lakes, a steamer officered by some of the finest men that sail our inland waters; it was ordered into the steamer by a man who has already made for himself a name to be envied, with prestige from the Mississippi to the Atlantic Ocean as an authority in engineering, more especially in matters pertaining to marine engineering and vessel construction; he is noted for his endless efforts to effect improvements, is unselfish, jealous of no other, anxious to do good always.

The contrivance after a couple of trips of the steamer during which changes were made, demonstrated the practicability of making the combustion of soft coal perfect; the wastes in the ash-pan were confined to white ash and to small cinder that had dropped through the grates before being fully consumed; the smoke from the smokestack was reduced in even the worst of firing to a volume much less than from a like boiler fired at the same time and not equipped with the contrivance, while with good ordinary firing the smokestack was remarkable for its cleanness; indeed one of the firemen showed by his firing during the whole time of his three-hour watch, on one occasion when firing fairly, that the contrivance was effectual in making combustion perfect and in preventing smoke from the smokestack.

The service of the other firemen, when firing as usual and fairly, or to use their own expressive language, not "monkeying," confirmed the results of service by that other fireman; they all maintaining the steam pressure steadily, without expelling smoke from the smokestack. They shoveled soft coal into the furnaces every six to seven minutes, the frequent firing increasing the liability to make smoke by the frequent supplies from the new coal of volatile matter and by reason of the frequent opening of the furnace doors to put the coal into the furnaces cooling the temperature; but notwithstanding the resulting effects from the use of the contrivance was bettered combustion, and no smoke from the smokestack.

Notwithstanding the apparent gains from use of the contrivance and the lessened discomfort from the heavy grit and smoke, there were grumblers, jealous of their rights to prevent the use of anything they saw fit, and that jealousy was not wholly within the boat; it extended, like the water in which they floated, to the ships of the company from which they had employment.

As in case of the model city, there were regulations for the direction of the users of the contrivance, and one of the orders was not to touch certain globe valves, that were to be at all times open to secure efficacy, and to give the contrivance natural protection from burning, the globe valves were never to be closed except in case of accident; to keep them open was to give the firemen an advantage in making steam; with the globe valves open the contrivance was in action, improving the combustion and preventing the issue of smoke from the funnel.

But there was a Bascomb about, some one who no doubt "wanted his rights," and Bascombs outside of the ship who were fearful of their "rights;" like Bascomb, they wanted the "right" to make smoke if they wanted to. They would rather have their "rights" than save to their employers the coal they wasted unburnt in the ash-pan; they would rather have their "rights" than save to their employers the gases they expelled from the smokestack instead of burning them in their furnaces; they would rather have their "rights" than save to the promenaders on the decks of the beautiful steamers the annoying showers of unburnt coal soot and smoke they thrust from their furnaces through their funnels upon them.

He who was the wiser Bascomb had ordered the contrivance into the vessel, but a Bascomb who could not say nay was still a Bascomb who wanted his "rights," and if he could not say nay, he could close the globe valves, burn the contrivance and have it taken out, why?

"He wanted his rights," and he saw that if only he would but touch the "button" the elements would give him his "rights;" the "button" was accordingly touched, the globe valves were closed, once, twice, three, then four times, and we know not how much oftener; then after doing so, when the contrivance had been abandoned each time to the fire until white with heat, the globe valves were opened, then the contrivance destroyed.

Nobody did it? oh, no! nobody did it! Perhaps it was an angel who watched and did it lest that we should arrive too soon at that millenium state of cleanliness for which our morality at present unfits us? Perhaps it was a mistake? Yes, perhaps it was a mistake? If a stone thrown by an unseen hand strike you, it may be a mistake. If in quick succession another stone thrown by an unseen hand strike you, then you have cause to be suspicious. If there quickly follow another stone thrown by an unseen hand and that strikes you, then will you be alarmed, and fear that some one is aiming at you. If a fourth stone again strikes you, then will you be convinced that some one has designs against you, and you remove to a safer place.

And so it was on that steamer; there was a Bascomb who had designs, a Bascomb who "wanted his rights;" there had been silent grumbling, there had been Bascomb gutturals, Bascomb nerve-twitchings, and sometimes even Bascomb damns, but after the contrivance had been a fourth time touched with the "button," then finished with the globe valve twist, there were Bascombs felicitations; here are some:

Bascomb No. 1—Well, Bascomb, you have done it.

Bascomb No. 2—Yes, it is bursted.

Bascomb No. 1—I am glad of it. Smoke! why I have no objections to smoke. Smoke! I send not only smoke but red hot flame out of my smokestacks, 8 and 10 feet high.

Stranger—Did you say that you sent red hot flame up out of your smokestack 8 and 10 feet?

Bascomb No 1—Yes, 15 and 20 feet high; I sometimes have my smokestacks red hot.

Bascomb No. 2—I once had my smokestacks red hot and sent red hot flames up from my smokestack 15 feet high, but I got hell for it when it was found out.

Yes, Bascomb wanted his rights, his rights to make smoke and red hot flame pass out of his smokestacks to the annoyance of the passengers and loss of his employers.

Fortunately all who feed a furnace, or attend an engine, or buzz about one, are not of the tribe of Bascomb, but all they of that tribe of Ishmaelites require the injunctions of their employers as the *sine qua non* to their employment.

The city of Detroit boasts a man of the name of Mackay* who believes in the *Sun* as the great source of light and heat; he is not a Bascomb, though he "wants his rights;" he saw his chimney give out soot, smoke and noxious gases that hurt the feelings,

* David P. Mackay, President of the *Sun* Publishing Co., Detroit, Mich.

injured the health, as well as the property of his neighbors, and made the sleepers in the hotels that were near to his place of business very uncomfortable; he wanted his rights, to conduct his business as he pleased, but he concluded that his neighbors had rights too, and he reasoned that he had just as little right to thrust soot, smoke and noxious gases at them as they would have to squirt dirty water at him; the more he reasoned as a reasonable man, the more he felt that his right to throw dirty water or noxious gases was bounded be the premises in which he conducted his paper to make light and heat. He argued with himself that the air was the common property of every man; that no court had the power to alienate it, and no government could concede the power to any man to pollute it; he decided to get from some source, something to aid him in burning his coal upon his grates instead of sending it out as unburnt gases to annoy others in the vicinage of his place of business; he heard of the contrivance, of its trials, and he decided to have it in, as an aid to the *Sun* to make light and heat, then pleased with the result, pleased with the evidence it afforded of his own good and progressively inclined mind, he spontaneously gave vent to his feelings, saying: "The *Sun's* smoke preventer a marvel of scientific skill."

STEAM DISINFECTING APPARATUS AT PROVIDENCE, R. I.

In the recently-issued eighth annual report of the Superintendent of Health of the city of Providence, R. I., says the *Engineering Record*, an account is given of the means for steam disinfection for carriers of contagious disease, such as carpets, bedding, clothing, etc., employed at that place.

During 1889 and a part of 1890, a wooden building was used for this purpose. The goods to be disinfected were placed in it and steam turned on through a 2-inch pipe from the boiler used to supply power to the stone-crusher in the city yard. This worked fairly well at first, though, of course, no pressure could be obtained, but in the course of a year the building became so warped by the alternate steaming and drying that the steam escaped freely on all sides and could not be supplied in sufficient quantity from the boiler. Charles V. Chapin, Superintendent of Health, has since had arranged a wrought-iron chamber for such disinfecting purposes.

A second-hand bleach kier was purchased and placed inside the old wooden building, and the 2-inch pipe connected directly with the center of the rear end. The front end is closed by a cast-iron door, 1-inch thick, with six ribs on the inside. It swings open on a hinge and is closed against a rubber gasket by means of 20 swinging bolts ¾ of an inch in diameter. The chamber is of three-eighths iron and is 9 feet long, excluding the "dish" of the rear end, which is about 1 foot more. A few inches from the bottom is an open floor or joist, and beneath this are a few coils of 1-inch pipe with live steam connection for heating. At the bottom is a small cock to draw off the water of condensation, and at about the level of the floor and near the front is a 2-inch blow-off. There is also a pressure gauge. The cost of the apparatus was $304.10. A movable wagon body of galvanized iron pipe was also provided. This is furnished with two covers, one of canvas, and an outside one of rubber. This wagon body was first made of black iron pipe wound with canvas, but it soon rusted and had to be replaced by galvanized pipe. It cost $56.99.

The method is to send the wagon to the house and remove the goods in it to the disinfecting chamber, which has been previously heated by means of the coil of pipe in the bottom. Pieces of canvas are thrown over the goods while in the chamber as an additional protection against moisture. The wagon body with its contents is then rolled into the chamber and the door tightly closed by screwing down the nuts on the bolts. The blow-off is then opened and steam turned on until the air is expelled, when the blow-off cock is closed and the pressure rises. It is held at from 14 to 16 pounds for one hour. The steam is shut off and the blow-off opened, and after a few moments the wagon body is rolled out. It is suggested that the iron chamber should be covered with some non-conducting material which would prevent much of the condensation and facilitate the warming of the chamber. The man who removes the infected goods from the house wears a light coat and overalls, which he removes at the disinfecting chamber and disinfects with the goods.

Little importance is attached to the suggested danger in transporting the goods through the streets. The danger of any morbid material being carried from the wagon, with its canvas cover tightly tied down behind, is considered to be very small, and the chance of any such escaping particles infecting any one in the open air to be much smaller.

THE NEW CITY HALL, CINCINNATI.

The contract for the plumbing of the Cincinnati City Hall was let to Nolan & Armleder and the high reputation of this house is a sufficient guarantee that the specifications will be strictly adhered to. The magnitude of the plumbing will be readily realized by the general description of the work given below, as well as the high class of workmanship required.

Every essential of modern plumbing has been carefully considered, and the huge building, when turned over for occupancy, will be as perfect as possible in its sanitary arrangements. Seventy closets will be placed in the police department in the basement, elegantly fitted out with trap-pipes. In the building will be forty-seven Nolan & Armleder's latest patent washout closets twenty-six Dalbon & Ingersoll's syphon urinals, thirty slop sinks, and several ordinary sinks. The police gymnasium will have ten enameled iron baths, two needle showers and five bowl stands. There will be six lavatories on each floor, with urinals, wash stands and slop sinks. The northeast and southwest lavatories will each be supplied with hot water, and also the police gymnasium.

All exposed as well as supply and flush pipes will be of brass and nickel plated. The marble about the water closets, urinals and wash stands will be the finest Knoxville marble, pink in color; and with brass clamps. And the plumbing work in general will be on a scale of magnificence and carefulness commensurate with the magnitude and importance of the building under construction. The entire contract for the plumbing is $23,750.

Nolan & Armleder are well known in commercial and building circles, and since the incorporation of the firm six years ago, they have handled some of the heaviest contracts in the city. They aim to do all work in the most thorough and commendable manner, with due regard for those principles of sanitation that have been evolved by sanitary experts in this day. They may be properly classed in the modern school of sanitation—that which has revolutionized in later years the methods of plumbing, and instituted those laws that have been so beneficial to the general welfare.

The firm is composed of E. J. Nolan and J. A. Armleder, and they make a specialty of sanitary plumbing and sewerage ventilation. They have convenient and eligible located quarters at 68 East Fourth street, where they keep constantly on hand a complete assortment of the latest improved sanitary novelties, and have every facility, such as ample capital, large stock and a competent force of skilled workmen, to complete the most extensive contracts in the most satisfactory manner, according to plans and specifications. They are also sole proprietors of the celebrated "Excel" polish, which has acquired an excellent reputation and an extensive sale throughout the country. It will be seen that the plumbing contract on the new City Hall was placed in safe, reliable and skillful hands.

A GREAT DRAINAGE SCHEME.

A bold scheme for the formation of a main drainage system for the whole of England has, remarks the *Health Record*, been devised by Dr. B. W. Richardson, the distinguished sanitarian. He proposes to construct along the sides of all the lines of the railways a series of conduits, either in iron tubing or brickwork, to commence at every place where there are houses near to be drained; to let the sewage be pumped into and carried along the tubes by the side of the lines, and be collected and conveyed by branch conduits to spots selected for its utilization, so that the land all over the country may receive the benefit of it for fertilization, away from the residences of men, and in a manner perfectly harmless to the health of communities. According to this system there would be no necessity for burying the pipes, provided they were of strong material; therefore there would be no engineering difficulties, except in the case of tunnels, and the expense would be small.

Passing to details, Dr. Richardson observes that these main ducts would be by no means large. In the immediate neighborhood of large towns the diameter would, perhaps, be measured by a few feet, but along the lines, for hundreds of miles, they would taper down to inches, and often cease altogether for long distances. In the case of the larger towns, there would be many starting places, so that there would be no need of enormous ingoing sewers. Every district would drain into its own main; the main would run into the outgoing nearest line of rail; and as the contents would run outwards towards the country, the size, even in such a city as London, would be by comparison extremely small. In this way the sewage of such a vast community would be disposed of in every possible direction. As regards London, it is proposed that 150 "stations" should be erected within a radius of twenty miles.

CINCINNATI PLUMBING, WATER-WORKS AND SMOKE NUISANCE.

FROM OUR SPECIAL CORRESPONDENT.

Smoke, like a pall, has hung over Cincinnati for the past two days; it is worse than I ever saw it in Chicago. They have an ordinance here but apparently make no effort to enforce it. It is a fine greeting to the Knight Templars of whom the city is full. They are here in attendance on their Forty-ninth conclave. They will go home after their meetlng is over and call Cincinnati the smokiest city in the country.

The Thomas Gibson Company are overhauling the St. Nicholas and the Grand hotel. The Grand is in charge of Mr. Andrews, who is making a splendid job of it, the plumbing being clean and thoroughly adapted to the several uses to which it will be put.

The goods used at the Grand hotel are as follows: 165 Knoxville and Italian marble wash stands; 70 Carlisle washout closets, Douglass traps; 40 C. I. bath-tubs, enameled; 1 six-bowl washstand, Italian; 2 double wash-stands, Knox; 1 nine-bowl washstand, Knox; 2,200 feet of brass pipe, 9,600 feet extra heavy Gale iron pipes; 5,000 feet of C. I. soil-pipe; 5,000 feet of lead wastes; 6 urinals; 4,100 feet of marble; 3 tanks, six feet width, 8 depth, 12 length; Peck's self-closing basin cocks and bath cocks, stop cocks under each fixture; 250 McClellan vents; 38 plumbers.

All the work of the Gibson company is under the general superintendance of Mr. Murphy, well known to the readers of The Sanitary News, by his ventilation system of which we will have more to say at an early day.

The foreman in charge at the St. Nicholas, is Mr. P. McHugh, who is a master hand in his work, doing everything in the best manner that could be pointed out.

Superintendent of Water Works Willis Tharp since last Wednesday has not had a full night's rest. The force of men put on the work of repairing the broken engines and bursted pipe have worked on without rest until, from fatigue, they can scarcely lift a tool.

The water in Eden Park reservoir is steadily decreasing, all the engines being used to pump into the Third Street basin. Monday the water in the north basin stood 5 feet 6 inches. At the same time Tuesday morning it stood but 3 feet 6 inches. The south basin held 15 feet Monday and at 9 o'clock Tuesday morning the guage registered but 10 feet 4 inches.

If the decrease continues at this rate the hilltops will be without water in a short time.

The water in the Third Street basin has dropped to the low guage of 14 feet, 4 inches, the average being 18 feet.

The following is an editorial taken from a Cincinnati paper, and I give it that it may be read.

Well, gentlemen of the Board of Administration, what have you to say for yourselves? How does it happen that you have let the Water Works engines go to pieces again and brought the city into imminent peril of a water famine? Is your Superintendent a really first-class engineer, and have you been devoting your time and energies and intelligence so strictly to the public business that no one can justly complain now that an unforeseen unavoidable accident has happened?

Everybody knows that our dilapidated water-works engines are but little more useful than a pile of old scrap iron. But it is impossible to substitute a new plant at once, and equally impossible to do without water while the substitution is going on. The point asked of the board is, have you used every caution, every effort within your power to guard the city's interest in this dilemma, until steps can be taken for an entirely new plant on a new system, such as a great city like Cincinnati now demands?

A strike is imminent among the workmen on the new City Hall, owing to the employment of the iron-workers who are not unionists. Clements, the iron contractor, refuses to discharge the non-unionists. The trouble will be the subject of a discussion at the Builders' Trades Council Friday night.

Tuesday the B. of A. appointed Henry Lathrop captain of the sanitary police in the place of the late P. O'Connell, salary to be $1,200 per year.

All in all Cincinnati is getting up very well except for her smoke. This cannot be stood long without bringing some action under the ordinance. This would be a great field for smoke consumers, for there is plenty of work for them to do here.

AMONG THE MANUFACTURERS.

Peck Bros. & Co. report a large increase in business. Among their many visitors from out of town were Mr. Alex. McKay, of the firm of Park & McKay, of Detroit; Mr. Woodward, of the Haines, Jones & Cadbury Co., of Philadelphia, and Mr. Thayer, representing Eton, Cole & Burnham, of New York City. No one but a confirmed dyspeptic could escape the contagion of Mr. O. D. Peck's genial manners.

The new firm of Beeler and Davis, of 136 W. Lake street, are meeting with the greatest success. Mr. Geo. S. Markham, well known to Chicago plumbers, will soon start on a sixty days' trip in the interests of this hustling firm. The J. L. Mott Co. have furnished 225 of their Porcelain Lined Iron Bath-tubs for the new Northern Hotel, and 115 of the same pattern for the Hotel Metropole. E. Baggot has the plumbing contract for both buildings, which is a guarantee that the work will be done in the very highest style of the sanitary art. Among the many new and expensive private residences which have been recently fitted throughout with the Mott Co.'s sanitary goods, we recall those of Messrs. Michael Brandt, the wealthy brewer, Ed. Morris, W. W. Kimball, Allison Armour, O. W. Potter, E. Mandel, President Baker of the World's Fair Commissioners, Rothschild, Corneau, Lackner, Peabody, Mackin, Wilkie, President Bowen of the Northern Trust Co., all in Chicago; Messrs. Frazier and Smythe, of Evanston, and Mr. R. A. Keyes of Kenilworth.

FOR THE DIGESTION.

If you want to know just how small a man is, give him an office or let him become suddenly wealthy.—*Texas Siftings.*

One of the most expensive things of this life is the reverse curve on the bottom of a champagne bottle.—*Boston Transcript.*

Character is like the grand old cathedral bell. Reputation is the brass tintinnabulum of the loud-mouthed auctioneer.—*Dallas News.*

A contributor inquires: "How can I tell the age of a horse?" "If you are anxious to sell the beast don't tell it at all."—*Washington Star.*

Mrs. Cumso—"Here's an account of a man who fasted forty days." Cumso—"He was a merchant who didn't advertise, I suppose."—*Detroit Free Press.*

A strange world this. In France, when a girl is pleasing, they say she is chic. Over here, when she doesn't please you, she's "an old hen."—*Yonkers Statesman.*

Doctor—"I believe you have some sort of poison in your system." Patient—"Shouldn't wonder. What was that last stuff you gave me?"—*New York Weekly.*

Mrs Dogood—"I suppose you have some idea what the future state is like?" Dusty Rhodes—"Yes; a place you will have plenty of time to do the work you won't have to do."—*New York Herald.*

Brines (incredulously)—"Is that man a typical New Yorker?" Jones—"Of course he is. He was born in Ireland."—*Washington Star.*

Teacher (in grammar class)—"Tommy correct the sentence, 'I kissed Susan onct.'" Tommy (promptly)—"I kissed Susan twict."—*Epoch.*

"Land Leaguer" writes to know where the first recorded eviction took place. The Eve-iction we believe, was from the Garden of Eden.—*Texas Siftings.*

Men judge a man's religion by his actions outside the church, and the women judge it by the brilliancy of his prayers within.—*Atchison Globe.*

It always spoils the effect of the sermon on a man who intends to put a nickel on the plate and absent-mindedly puts on a quarter.—*Buffalo Times.*

Jinks—"Cholly doesn't seem to have any presence of mind." Filkins—"No, but it's all his parents' fault. They didn't present him any."—*New York Herald.*

Mr. Benedick—"Will you be my wife?" Miss Beatrice—"Yes." Mr. Benedick—"O, Miss Beatrice, this is so sudden! Give me time to reconsider."—*Harper's Bazar.*

Butcher—"How would a saddle of mutton suit you, ma'am?" Miss Batchem—"Very well; but let it be a side saddle, because it's for my sister and myself."—*Binghampton Republican.*

Sympathetic Friend—"Your health appears to have improved greatly of late." Convalescent—"Y-e-s, I've been off among strangers who didn't eternally talk about it."—*New York Weekly.*

Mr. Istery—"I have just discovered why performers at minstrel shows always blacken their faces." Mr. Curio—"Well?" Mr. Istery—"They are afraid to perpetrate their jokes until disguised."—*Colorado Sun.*

Family jars are always leaky.—*Galveston News.*

Some cadidates are elected to office who don't care to look at the election returns in the face.—*Washington Star.*

He—"I have had you in mind a good deal lately, Miss Helen." She—"You always did try to make me feel small, Mr. Chumply."—*Brooklyn Life.*

"What caused Chappie's wrath yesterday?" "A man on a crowded horse-car got up and offered him his seat. Said he could see Chappie was disguised."—*New York Herald.*

First Passenger (on railway train)—"I have an idea that is an eloping couple." Second Passenger—"No, they're married. He's been in the smoking-car the last two hours."—*New York Weekly.*

"You had better accept Mr. Hipple," said Mrs. Elder to her daughter; "it is your last chance." "You think this is the court of last resort, do you, mamma?" asked the girl.—*Detroit Free Press.*

"H'm—that young man of yours—is he worth anything, financially?" "Why, yes, papa. He is worth at least $35 a week to the store, he says, though they only give him $10."—*Indianapolis Journal.*

"I feel like a Queen—and you are all my pages," said the popular girl to the group of dudes surrounding her. "Nearly enough to make a blank book," remarked her envious rival.—*Harper's Bazar.*

PLUMBING NOTES.

The plumbers of Madison, Wis., have organized a union, with the following officers: President, Edward Dedwith; secretary, W. J. Meltzer; treasurer, Anton Metz.

Interesting evidence showing how one firm has been assessed three times was developed by the examination of Joel Cadbury, of the Haines, Jones & Cadbury Company, Philadelphia, whose place of business and foundry is situated at Ridge avenue, Buttonwood and Spring Garden streets. Mr. Cadbury stated that the establishment covered the numbers 1130 to 1144 on Ridge avenue and several numbers on the other streets, though he could not tell what they were. The book showed that "Cadbury & Co." was appraised as dealers; and Haines, Jones & Co. twice, once as "plumbers' supplies" and again as "steam fitters."

Last week at Philadelphia, Mr. Roger Barrett, a young plumber, was arrested for committing an assault and battery on Mrs. Maggie Oys. The trial came off and Mr. Barrett was found not guilty, the lady having been found the offending party.

J. M. Carson came to Danville from Louisville, Ky., in 1882, as constructing engineer for the building of the water-works and held that position with the company for six years when he went into business for himself three years ago. He served an apprenticeship with the Gibbons, of Cincinnati, Ohio, one of the oldest and largest establishments of the kind in the west, finishing his trade in August, 1856. At the breaking out of the rebellion he enlisted in the 74th Ohio, serving the entire time of the war. After his muster out he went to Louisville, Ky., where he carried on the leading plumbing business of that city for ten years. While a member of the school board in this city, he took an active part in the building up of the schools, and as chairman of the building committee was instrumental in the erection of the high school and Lincoln school buildings, two of the best constructed school buildings in the state. He is the inventor of a steam heating boiler for heating public and private buildings with water. He has put the Haxton heater in 35 houses in Danville and vicinity. He does all kinds of plumbing and pipe work, and keeps a corps of the very best workmen in their several departments. His place of business is at No. 32 North Hazel street.

Gresham & Mann, located at No. 113 North Vermillion street was established November last, and ranks as one of the leading firms in the city. The senior member of the firm came to Danville from Champaign last June, where he was foreman for Robinson & Burr, machinists. The firm name was first Kimball & Gresham. Mr. Gresham is a practical man in his business, having been a machinist for years. Mr. Mann, the junior partner, although having not regularly "learned the trade," is nevertheless sufficiently conversant with his business to answer all purposes. Their specialties are gas fixtures, globes, marble wash stands, closets of all kinds, Richardson, Boynton & Co. hot water heaters, the celebrated M. E. Herbert magazine baseburner boiler, pumps, sinks, bath tubs, brass goods, pipe and fittings, etc. They do all kinds of steam and hot water fittings (plumbing of the best quality and guaranteed), gas fitting of every kind, and also contract for connections for city water service. A full line of electric bells and batteries is also kept in stock, and Mr. Gresham being a fine electrician, is competent to fit the same to order. The patronage of the public is respectfully solicited, with the promise that entire satisfaction in the several lines of work will be given and guaranteed. at 113 North Vermillion street, Danville, Ill.

Mr. J. M. Carson, of Danville, Ill., states that business is good there at present and a good prospect for the future. We like to get letters such as these and express to Mr. Carson our thankfulness for his letter, and trust he will find THE SANITARY NEWS all right in every particular.

Mr. Peter J. Gall, of 9, Massachusetts ave., Indianapolis, Ind., writes us that matters are running smoothly with the association members at that place, and that business is good. That is what we like to hear. Come on and give us an idea of what is going on.

Economy in house-cleaning is not always wealth. A Southwark gentleman who saw no sense in having a plumber to clean out the water tanks of his bath-rooms undertook the job himself a couple of days since. After he had ruined the bath-room walls and a $10 pair of pants he sent for the plumber.

We had the pleasure of meeting the old war horse of St. Louis, W. H. Graham, in our city this week. Mr. Graham is here in the interest of some of the products of his inventive skill and ingenuity in the shape of basin traps and other specialties of merit, of which we will speak more fully later. He reports business booming in St. Louis; all of the plumbers there are reported busy and getting good prices for their work. We shall have something to say in the near future taking up in detail the merits of Mr. Graham's specialities. We wish him success, however, in any undertaking and we know the sentiment will be echoed by the plumbers of this city, who can never forget the manly stand taken by Mr. Graham for everything concerning the best interests of the fraternity.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

295 Austin ave., Nelson & Cederholm, 87 W. Ohio street.
1139 Adams streets, D. Jack, 882 W. Lake street.

5614 Aberdeen street, J. Emblem, 256 31st street.

Ashland ave., S. of 54th street, J. Curtin, 4929 S. Ashland ave.

5021 Aberdeen street, C. Kostlevy, 218 W. Eighteenth street.

277 Bowen ave., W. K. Horner, 4138 Cottage Grove ave.

4447 Berkeley ave., W. Bowden, 238 25th street.

34 Byron ave., H. Breyer, Jr., 1706 Milwaukee ave.

Cottage Grove ave. and 67th street, J. Wittich, 76th street and S. Chicago ave.

6143 Carpenter street, O. Heyman, 300 Washburn ave.

448 Claremont ave., M. G. Brooks, 1111 W. Harrison street.

Crawford ave. and River street, C. Kostlevy, 218 W. Eighteenth street.

208 Clark street, G. Fehr., 80 Canalport ave.

Center ave., S. of 73d street, J. Bain, 6338 Justine ave.

Chicago ave., E. of Noble, R. C. Miller, 871 W. North ave.

279-81 Division street, J. H. Sullivan, 328 E. Division strret.

747 Eighte1nth street, C. Kostlevy, 218 W. Eighteenth street.

714 Eighteenth street, J. Hois, 609 W. 21st street.

Evans ave., S. of 47th street, J. Hardin, 4539 Cottage Grove ave.

161 Eighteenth street, J. Martin, 215 22d street.

1300 Fulton street, H. S. Thompson, 201 E. Randolph street.

40th and Kinzie streets, E. Breyer, 72 W. Randolph street.

45th and State streets, J. O'Malley, 215 Wells street.

48th street and Oakley ave., O. Heyman, 300 Washburn ave.

18-20 Frankfort street, D. Daly, 946 Seymour street.

Fairfield ave. and Eighteenth street, Dornbos Bros., 573 W. Eighteenth street.

53d street, E. of Lake ave., W. H. Cummins, 1236 W. Van Buren street.

46th and Goodspeed streets, J. Curtin, 4929 S. Ashland ave.

47th street and Center ave., J. Curtin, 4929 S. Ashland ave.

Greenwood and Center aves., J. Doyle, Holcomb ave., W. of Hunting ave.

Hunting and Montrose aves., J. Doyle, Holcomb ave., W. of Hunting ave.

192 Humboldt ave., H. C. Burg, 1595 Milwaukee ave.

193 Heine street, H. C. Burg, 1595 Milwaukee ave.

6410 Honore street, T. Bryson, 6335 Wentworth ave.

Halsted street near Otto, Schneider Bros., 725 Sheffield ave.

287 Irving Pl., Jos. Breen, 373 W. Van Buren street.

Jackson ave., and 53d street, J. M. Collins, 356 37th street.

Justine ave., south of 54th street, J. Curtin, 4929 south Ashland avenue.

864 Kedzie ave., H. C. Burg, 1595 Milwaukee ave.

763 Loomis street, C. Uher, 524 W. Eighteenth street.

639 Leavitt street, J. Geiss, 161 Southport ave.

3161 La Salle street, J. Teutsch, 2961 Wentworth ave.

Lake ave. and Columbia Pl., P. Desmond, 906 W. Lake street.

Lake ave. and 55th street, J. Hardin, 4539 Cottage Grove ave.

6821 Laflin street, J. Bain, 6338 Justine ave.

Laflin street, south of 53d street, J. Curtin, 4929 south Ashland avenue.

Loomis and 48th streets, C. Kostlevy, 218 W. Eithteenth street.

Marshfield ave. and Fourteenth street, Nash & Harna, 2216 Wabash ave.

Mozart and Cortland streets, H. Breyer, Jr., 1706 Milwaukee avenue.

6214 May street, T. Bryson, 6335 Wentworth ave.

43 May street, Oliphant & Liddell, 268 W. Madison street.

347 Monroe street, J. J. Hamblin & Co., 348 South Robey street.

1032 Nineteenth street, C. Uher, 524 W. Eighteenth street.

Nineteenth street east of Oakley ave., C. Kostlevy, 218 W. Eighteenth street.

95th street and Ft. W. Tracks, A. L. Thompson, 9138 Erie ave.

Oakdale ave., south of Halsted street, J. Schuer, 737 Lincoln ave.

Park ave. and Centre street, J. Doyle, Halcomb ave. W. of Hunting ave.

3547 Prairie ave., Wm. Bowden, 238 25th street.

Polk street west of Francisco, W. Cummins, 1236 W. VanBuren street.

314 Polk street, W. Cummins, 1236 W. VanBuren street.

St. Charles ave. and Centre street, J. Doyle, Holcomb ave. W. of Hunting ave.

Stewart ave. south of 26th street, T. Conlin, 3903 Cottage Grove avenue.

Shields ave., S. of 26th street, J Kotva 7516 Dobson ave.

62d street, W. of Wallace, T. Conway, 614 63d street.

Stony Island ave. and 69th street, J. Hardin, 4539 Cottage Grove ave.

5034 State street, P. Schmidt, 4928 State street.

6732-34 Sangamon street, J. Bain, 6338 Justine ave.

580 32d street, C. Uher, 524 W. Eighteenth street.

32d street and Vincennes ave., Nash & Harna, 2216 Wabash ave.

Taylor street and Claremont ave., C. J. Brooks, 879 W. Polk street.

160 24th Pl., E. Connor, 2464 Archer ave.

30 25th Pl., E. Connor, 2464 Archer ave.

36th street nr Gage street, E. Connor, 2464 Archer ave.

584 37th street, M. Weber, 477 26th street.

Trumbell nr Ogden ave., A. H. Forster, 800 W. Twelfth street.

Twelfth street and Sawyer ave., C. Kostlevy, 218 W. Eighteenth street.

Union ave., S. of 28th street, J. Quinn, 2543 S. Halsted street.

Union and Kramer streets, C. Kostlevy, 218 W. Eighteenth street.

193 Van Buren street, J. Teutsch, 2961 Wentworth ave.

498 Winchester ave., C. Uher, 524 W. Eighteenth street.

Wabash ave. and Fourteenth street, Nash & Harna, 2216 W. Polk street.

528 Wells street, Val Ruh, 548 Wells street.

2714 Wallace street, M. Weber, 477 26th street.

128-30 Wells street, E. Sheehan & Co., 222 Illinois street.

3708 Wentworth ave., E. Hennessey, 3247 State street.

603 Washtenaw ave., L. A. Keppner, 57 Dearborn street.

39 York street, Nelson & Cederholm, 87 W. Ohio street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Cass Chapman has designed a 4-story warehouse for George D. Morgan, to be built at Johnson street; cost, $20,000. Henry Sierks has completed plans for a 2-story store and flat building, 65x80, for Peter Thompson, to be built on Milwaukee avenue; cost, $12,000. H. M. Hansen has designed two blocks of 2-story, basement and attic dwellings, to be built at the corner of Belden and Sheffield avenues, to cost $32,000. Julius Speyer has designed a 3-story and basement apartment house for Peter Burk, to be built on Kimbark avenue, between 55th and 56th streets; cost, $18,000. D. S. Pentecost has designed for S. A. Wright a 4-story apartment house, 60x60, to be built on St. Lawrence avenue, between 48th and 49th streets; cost, $45,000. Jul. D. Horvath has planned a 2-story dwelling for G. T. French, to be built on Yale, near 66th street. It will be heated by steam; cost, $7,000. He has also planned for W. E. Means a 2-story and attic dwelling, to be built at Peru, Ill.; cost, $5,000. The Illinois Central Railroad has sent out invitations to a few of the prominent architects in this country, inviting them to submit competitive designs for a new railway station to be built in Chicago at a cost of $1,000,000. The station will be used by that road and the Michigan Central. It is to be commenced within sixty days. Charles S. Frost has designed a very handsome 3-story and basement house, 44x96, for S. M. Fischer, to be built on Drexel boulevard, near 51st street; cost, $50,000. Mr. Fischer will also build a barn in the rear. It will be two stories, 40x35, and will be constructed of brick; cost, $5,000. Thomas & Rapp have plans under way for a 3-story and attic residence, 25x85, for Dr. Charles W. Purdy, to be built on Twentieth street, near Prairie avenue; cost, $15,000. The same architects have designed a 4-story flat building, 75x80, for Mr. Wachsmith, to be erected on Stanton avenue, near 30th street; cost, $25,000. They have also just closed contracts for two factories on Shields and Stewart avenues and 26th street, for George Enger; cost, $50,000. George Beaumont has designed a 4-story flat building, 45x68, for H. M. Clark, to be built on Fletcher street, near Evanston avenue; cost, $15,000. L. B. Dixon has plans under way for a handsome 2-story attic and basement residence, 25x76, which P. Walker, of Washburne, Wis., will erect at 3213 Calumet avenue. It will be heated by steam; cost, $18,000. He has also planned a 3-story and basement shoe factory, 200x44, to be built at Dixon, Ill., by C. H. Fargo. It will be of brick and mill construction; cost, $30,000. J. M. Van Osdel & Co. have completed plans for a 3-story and basement apartment house, 27x94, to be erected at the northeast corner of Leavitt and and Flournoy streets by Mrs. P. B. Weore; cost, $20.000. E. M. Newman has designed a 3-story and basement flat building, 25x

80, for Robert Miehle, to be built at the corner of Addison street and Sheffield avenue. It will be heated by steam; cost, $10,000. He has planned a 2-story dwelling, 35x55, for W. P. Gray, to be built at Ravenswood. It will cost $5,000. Hetherington & Warner have designed a 4-story flat building, 25x80, for J. J. Ward, to be built on Oak street, near the Lake Shore drive; cost, $14,000. E. R. Krause has designed a 2-story residence, 20x100, for Miss Sherwood, to be built on 37th street, near Cottage Grove avenue; cost, $12,000. J. A. Thain has designed a 3-story and basement flat building for Mrs. Virginia Garland, to be built at the corner of 24th street and Prairie avenue; cost, $25,000. Work has been begun by Frank Cox on a new 3-story building at the southeast corner of Cambria and Ormes street; the building will be 50x122; adjoining will be a boiler house, 18x39. Jacob Maish broke ground for eleven neat 2-story dwellings on the north side of Indiana avenue, west of Bushill street; the buildings will be 14x42, have ornamental fronts and be fitted with all improvements.——Philadelphia, Pa.: A new structure is to be erected at 917 Arch street for Stewart, Ralph & Co. The building will have a front of 30 feet, with a total depth of 141 feet 3 inches to the back street. It will be six stories high, and is intended for light manufacturing purposes. The plans were prepared by John Frazer & Son, and the materials will be brick, stone and iron. John J. Cassidy, who owns a tract of land at 4th and McKean streets, is about to erect 250 small dwellings on it at an estimated cost of $300,000. Permits for the first fifteen 2-story brick dwellings were issued last Saturday. These fifteen houses are to be built on the south side of McKean street, east of Moyamensing avenue.——Cincinnati, O.: W. W. Franklin has plans for a block of ten residences for Thos. W. Keeveny; to be built of frame with stone foundations; cost, $40,000. The same architect has plans for a residence at Wyoming, O., for Joshiah Kirby; to be two and a half stories, built of common and pressed brick, with stone foundations and trimmings; cost, $12,000.——San Francisco, Cal.: Mooser & Cuthbertson have plans for a new opera-house for Oakland, the cost to be about $145,000. Messrs. Shea & Shea are preparing preliminary designs for the new church, parsonage and schools to be erected in the Sacred Heart parish. This group of buildings will be erected on Fell street, extending from Fillmore street 250 feet south. The church, which, like the other buildings, will be of stone, will be 65x137.6; to cost $70,000. Samuel Newsom has completed plans and specifications for a spacious opera-house for Eureka, Humboldt County. The owner is William Carson and the cost will be about $100,000. Mooser & Cuthbertson have prepared plans for a Hall of Records for Sutter County; cost, $25,000; contractors, Swain & Hudson, of Marysville. The same architects are preparing plans for additions to the Yuba County Court-house. Salfield & Kohlberg are about to erect a 4-story brick building, finished in sandstone and terra cotta, on Geary, between Dupont and Stockton, for Mr. S. Sachs; cost, about $20,000.——Washington, D. C.: W. R. Hearst, of the San Francisco *Examiner*, proposes to erect an 11-story building to be used for newspaper offices. The cost will be nearly $2,000,000.

HEATING AND LIGHTING.

The following new electric light companies have been recently incorporated: Pulaski Electric Light Co., of Pulaski, Va.; President, J. R Miller; Secretary, R. B. Berkeley; $5,000. Cambridge Electric Light & Power Co, of Cambridge, Mass.; President, A. B. McNish; Secretary, W. L. Hitchcock; $7,000. The Waterloo Electric Light & Power Co, East St. Louis, Ill; incorporators, Wm. Murdock, R. M. Hammon, and others; $10,000.——Ducktown, Tenn.: An electric light plant is to be established here by the Polk County Mining Co.——Providence, R. I.: It is proposed to establish a municipal lighting plant——Little Falls, N. Y.: It is proposed to raise $50,000 for electric lighting.

SEWERAGE NOTES.

Bridgeport, Me.: The council has recommended extensions of the sewerage system.——Meriden, Conn.: The sewerage committee has reported in favor of a separate system, conveying the storm and surface waters into the streams, and disposing of the sewage by surface irrigation. Mr. C. P. Bassett has made a report, and his estimate for 36 in. trunk sewers, based on Mr. McKinzie's plans, is $128,000.——Middletown, N. Y.: A sewer is projected on Monhagen avenue.——Clinton, N. Y: Civil engineer A. M. Scripture has reported on the proposed sewerage system and a board of sewer commissioners has been appointed——Hornellsville, N. Y.: Surveys for a system will be made by Mr. C. P. Bassett, of Orange, N. J.——Niagara Falls, N. Y.: Mr. Geo. W. Wright is the president of the new board of sewer commissioners. The proposed sewer system will be 17 miles long.——Williamsburg, N. Y.: A sewer is to be built along N. 15th street at a cost of $108,000.——Roanoke, Va.: The council has appropriated $15,000 for work on the intercepting sewer, and proposals will be advertised for.——Knoxville, Tenn.: Plans for a system of sewerage for the entire city have been prepared, and it is proposed to employ an expert to examine and report upon the proposed system. Mr. M. Nicholson is City Engineer.——Athens, Ga.: An ordinance on sewer connections has been adopted.——Ottawa, Ill.: A sewerage system will be put in at a cost of from $50,000 to $75,000. Mr. A. Rosewater, of Omaha, Neb., has prepared the plans.——Sioux City, Ia.: The West Side is to have a sewerage system. City engineer Wingeland is preparing the plans.——Santa Barbara, Cal.: A sewerage system has been decided upon. Fairhaven, Wash.: A trunk sewer is to be built at a cost of $24,000.

WATER WORKS NOTES

Boscawen and Penacook, N. H.: A company has been organized with C. H. Amsden, president, E. E. Graves, clerk, and J. C. Pearson as manager. A survey will be made for a supply from Great Pond. A fire precinct has been organized in Penacook.——Bradford, Vt.: The village voted on Sept. 11 to bond the town for $20,000 for works and elected five commissioners.——Northampton, Mass.: The sum of $5,000 has been voted to extend 8 and 6-in. mains.——Newburn, N. C.: It is reported that the construction of works will soon be started.——Snohomish, Wash.: Bonds to the amount of $60,000 have been voted for works.——Elgin, Tex.: The mayor has been authorized to advertise for bids to build works.——Goldthwaite, Tex.: Works are wanted.——Orange, Tex.: Works are under consideration——Ironton, Col: The Ironton Water, Light & Power Co. has been incorporated; capital stock, $50,000——Cleveland, O.: Bids will soon be asked for the work preliminary to the extension of the intake tunnel from the present intake crib.——L'Anse, Mihc.: It is reported that works are wanted.——Maroa, Ill.: It is stated that the village will build works to cost about $10,000——Moline, Ill.: It is reported that a new intake will be laid. The present pipe is 3,000 ft. long, in a rock trench.——Tuscola, Ill.: A vote in favor of works has been cast.——Macon, Ga.: A bill has passed the House authorizing the city to issue about $400,000 of bonds for works. The present works are owned by a company.——Lander, Wyo.: It is stated that bids for a franchise are wanted. The town is near a mountain range and on a stream with an average fall of 100 ft. per mile——Lake City, Minn.: Water and electric lighting plants are talked of.——Rockville, Conn.: The company talks of increasing its supply and enlarging its works. H. W. Ayers is engineer for improvements.

BIDS AND CONTRACTS.

Flushing, L. I.: Proposals are wanted until October 6, for the construction of a masonry waste weir and Culverts, at the impounding reservoir. Address G. A. Roullier, Superintendent, as above.——Grafton, W. Va.: Proposals are wanted until October 1, for the construction of a system of water-works. Address Mayor George W. Chambers, as above.——Cleveland, O.: Proposals are wanted until September 23 and 30, for the construction of sewers in certain streets. Address R. R. Herrick, Director of Public Works, as above.——Fort Leavenworth, Kan.: Proposals are wanted until October 1, for the erection of a store building to contain 16 sets of quarters for bachelor officers. Address F. H. Hathaway, Captain and Assistant Quartermaster, U. S. A., as above.——Columbus, O.: Proposals are wanted until October 14, for the erecting of a building for a Geological Museum for the Ohio State University, in accordance with the plans and specifications on file in the Auditor of State's office, and also to be seen at the office of J. W. Yost, architect, in this city.——Orange, N. J.: Until Oct. 5, sealed proposals will be received for the construction of about 25,000 feet of outlet sewer. Horace Stetson is city clerk.——Augusta, Ga.: Former proposals for electric lighting have been rejected, and new bids are called for.——Youngstown, Ohio: Proposals will be received for an electric light plant with 50 arc lights of 2,000 c. p.

BUILDING PERMITS.

J. J. Love, 3-sty and bst brk flts, 25x53, 617 N. Oakley ave..... $ 6,000

Mrs. Wm. Waller, 4-sty brk str and flts, 48x71, 299-301 Schiller st; a, Huehl & Schmidt..... 15,000

Hugh Cassidy, 3-sty and bst brk flts, 22x56, 50 Johnson st..... 5,000

Freeman Campbell, 3-sty and bst brk str and flts, 100x24, 249 Fullerton ave..... 5,000

Henry Gabler Brewing Co., 6-sty and bst brk brwry, 74x134, 3433 43 Ullman st; a, Wolf & Lehle..... 40,000

Mrs. Annie M. Meadenbauch, 2 3-sty and bst brk strs, flts and halls, 51x73, 378-80 S. Western ave; a, Faber & Pagels..... 25,000

Allen C. Waterhouse, 2 sty and bst brk flts, 27x74, 345 Warren ave; a R. S. Smith..... 6,500

Chas. Hess, 4-sty and bst brk str and flts, 24x72, N. E. cor. Sheffield ave and Concord pl; a, Mr. Woener..... 10,000

Albert Jaudd, 3-sty and bst brk flts, 23x74, 597 Laflin st..... 5,800

Butler Street Foundry Co., 2 and 1-sty brk fndry and shed, 100x65, 3422 32 Butler st..... 5,000

James Sirovy, 2 3 sty and cel brk flts, 20x79, 522-24 Morgan st; a, Catterdan & Proost..... 12,000

The Mecca Company, 4-sty and bst brk apmt bldg, 266x226, 3336-58 State st; a, Edbrooke & Burnham..... 600,000

Dr. G. Fischer, 3-sty and bst brk str and flts, 23x80, 958 Ogden ave; a, H. S. Jaffrey..... 8,000

Chas. H. Marshall & J. F. Keeney, 14 and 16-sty and bst brk str and office bldg, 48x100, 186-88, E. Madison st; a, C. J. Warren..... 300,000

August Wetzel, 4-sty and bst brk flts, 22x80, 859 N. Halsted st; a, H. P. Beiler..... 5,000

Chase & Tate, 3 2-sty and bst brk dwlgs, 60x65, 3224-28, Vernon ave..... 15,000

Marquette Club, repairs and alterations, N. E. cor. Maple st and Dearborn ave..... 6,000

Cyrus Farrer, 3-sty and bst bk dwlg, 32x54, 36 S. Homan ave; a, L. G. Jones & Co..... 14,000

J. G. Diven, 2-sty and bst brk frnt addn, 21x52 3736 Ellis ave; a, R. G. Diven..... 6.500

Sam'l Sullivan, 2 3 and 2-sty and bst brk strs flts and rear dwlg, 46x50, 3139-31 Wentworth ave..... 11,000

John Gertenreich, 3-sty and bst brk flts, 25x 76, 65 Jay st..... 6,000

Ammand F. Farlin 2 3-sty and bst brk dwlgs, 53x82, 64 and 65 Lake Shore drive; a, H. I. Cobb..... 40,000

Edward P. Fitzgerald, 3 and 2-sty and bst brk flts and brn, 24x54, 10 5-07 Osgood st..... 9,000

C. H. Martens, 3-sty and bst brk flts, 21x56, 420 Ashland Bld..... 7,500

Thomas K. Cameron, 3-sty and bst brk flts, 24x 54, 346 Winchester ave..... 6,000

Richard Peck, 6 2-sty and cel brk dwlgs, 22x42 7011-29 Stewart ave; a, J. A. Miller..... 45,000

Eugene Schaeffler, 2 3-sty and bst brk strs and flts, 44x60, 4610-12 Wentworth ave..... 7,000

John Peyton, 3 2 sty and bst brk flts, 59x60, 6955-59 Wright st..... 15,000

Mrs. A. Ederer, 2 2-sty and bst brk flts, 44x64 1710-12 Briar Pl; a, J. P. & J. F. Doerr..... 8,000

Albert A. Cornish, 3-sty and bst brk flts, 21x62 528 Burling st..... 6,000

Richard Lothhortz, 3-sty and bst brk dwlg, 33x 80, Lake View Bld and Fullerton ave; a, Aug. Fielder..... 25,000

J. D. Corlitt, 3-sty and bst brk flts, 21x54, 1232 Lill ave..... 7,000

H. M. Clark, 2 3-sty and bst brk flts, 45x63, 1641-43 Briar Pl..... 10,000

Will H. Moore, 4 and 3-sty and bst brk livery stbl and flts, 60x146, 520-10 Lake ave; a. C. M Palmer..... 50,000

David Nolan, 3-sty and bst brk livery stble 25x 120, 5215 Jefferson ave..... 28.000

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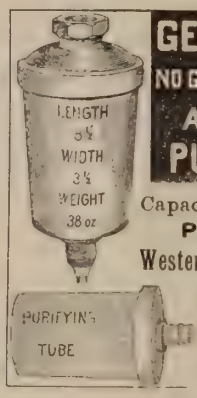

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Address all communications to The Sanitary News, 90 La Salle Street.

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An exchange in speaking of the engineers for water-works say it would be well if every water engineer had such a knowledge of the simple methods of chemical and bacteriological examination of water and of the use of the microscope in identifying the larger organisms liable to occur in water supplies, as would enable him at any time to make definite and positive statements as to the existence of pollution, without the necessity of calling in experts, and we do not doubt that this knowledge will soon be considered indispensable to those who are charged with the supervision of a city's water supply. Such examinations should not be made occasionally and spasmodically, under the stimulus of an outbreak of diarrhœa or typhoid, or of complaints about foul odors or turbidity in the water, but should be carried on regularly and systematically, so that the first beginnings of abnormal conditions can be noted and recorded. The engineer should, as far as possible, be the first to call attentian to approaching trouble — the first man to make complaint about pollution of his sources of supply. The knowledge which will enable him to do this is skilled knowledge, which can only be acquired by special study and training; and which must be paid for by the community who have the benefits of it. Ability to lay mains, make pipe connections, and run an engine are not the only qualifications which are now demanded of a water engineer, and the younger members of the profession should bear this in mind while they still have leisure to acquire the chemical and microscopical training of which they will surely feel the need in the future.

* * *

At the meeting of the Section on State Hygiene the question of "Sanitary Registration of Buildings" was the subject for reading papers on and discussion. Mr. Judge, of London, spoke in the discussion of the two papers and in the course of his remarks said he thought the tendency at the present time to place everything under state control was a mistake in regard to sanitation, but where the state did interfere he wished it to be a reality. When the sanitary authority inspected a house and put the owner to expense in alterations, it was only right that a certificate should be given to that owner which would protect him from further demands on the part of the same authority. He thought, however, that it would be better to leave the detail of sanitary work in the hands of private practitioners, rather than to hand it over to a public department. Let the public authority insist on private practitioners being competent, and then with a registration of the sanitary condition of all buildings there would be adequate protection of the public health without undue interference with individual liberty, and without the danger of stereotyping imperfect systems of sanitation.

* * *

Dr. George S. Hull, in a recent number of the *Medical News*, advances a very plausible suggestion as to the cause of poisoning in some ice creams, when he states that a modern ice-cream freezer, with its contents, is in reality a galvanic cell, or battery, in which the cream, especially if it is mixed with fruits, becomes the fluid, and the zinc and tin, or zinc and copper, of the freezer becomes the positive and negative elements of the battery. Dr. Hull has proved that electrical action does take place in an ice-cream freezer, and, taking place, of course corrodes the metal in which the cream is contained, producing poisonous salts that vary in amount according to the activity of the corrosive action, and the length of time the cream remains in the freezer. This explanation, from a scientific standpoint, is certainly plausible and suggestive, if found to be correct, of an easy method of avoiding the chances of being poisoned by eating ices.

* * *

A correspondent of the *Scarborough Gazette* writes: One of the points elicited by the Hygienic Congress in London is the remarkable fact that no less than 75 per cent. of the houses in Leeds are constructed on a plan which the Congress held to be highly insanitary. These houses are built on the so-called back-to-back principle, in blocks of, say, sixteen houses, arranged in two parallel rows of eight each. In the middle of the block there is a vacant space of 15 feet wide, in which the closets for all the sixteen houses are placed. The Leeds representatives defended the system on the ground of economy, they having by means of it solved the problem to bring the buildings within the reach of the working-man. The Architectural Section of the Congress, how-

ever, condemn the practice in the strongest terms, the chairman expressing his regret at such a lamentable state of affairs.

* * *

The *Sanitary Record* says: Carpets are commonly made to cover the entire floor of rooms. This cannot be too much deprecated. Carpets, like curtains, are mere dirt traps, which become loaded with filth of every description. This is abundantly proved when a carpet is swept, and the dust allowed to settle on all the articles in the room. Such dust, if examined, will be found to consist of dried mud, chiefly granite or wood, but also containing every description of vegetable and animal impurity. The substitution of a central carpet for one covering the entire floor is a great improvement, the floor round the carpet being covered with parquet veneering; or, if the expense of this be too great, the whole floor may be painted with four good coats of dark oil paint, and varnished, the joiuts of the boards having first been made secure. The carpet should be made easily removable, in order that it and the floor may be thoroughly cleansed at intervals. Rugs will be found even better, since they may be taken up and shaken every day, if necessary. In bedrooms, the less carpet the better.

* * *

The *Hospital* says that the special meeting which was convened to discuss the question of sanitary progress in India seems to have come to the conclusion that the progress has not been very great. Certainly a more appalling account than that which was given by Surgeon-Major Kirtikar and Mr. Ghole of the average sanitary condition of Indian towns and villages could not be well imagined. The water, upon which they are generally dependent for drinking and cooking purposes, is only filthy to the extent of being actually poisonous. The air of the small houses is so horribly vitiated that many of the natives fall victims to pulmonary consumption without having been touched by any hereditary taint. Ventilation and cleanliness in the streets and narrow alleys are simply non-existent, whilst cholera and fever are invited and encouraged by every condition of ordinary Indian life. The supervising sanitary officer of a large village is very often the lowest revenue officer of the district, probably a man without any special education, or, indeed, with very little education at all. As long as the initiative rests with such men reform is likely to be long in coming.

THE DEMAND FOR GOOD PLUMBING.

Wherever any knowledge of plumbing exists, there will be found a demand for good plumbing. Wherever no such knowledge exists, there will be the same indifference manifested in plumbing as in most everything else of which the people are ignorant. These are two propositions that need not to be given any time for argument. Where the people possess some knowledge of plumbing, of the importance of good plumbing, there will be a demand for it. They will not consent to live in a house where the plumbing is suspected of being defective, filling their houses with poisonous gases, and preparing avenues for the entrance of the filth of other houses. Take such a person into any house for the purpose of renting it to him, and the first thing he will do will be to examine the plumbing, and if found defective, will not touch it. That settles the whole question. The subject of rent, promptly paid, must be set aside. It is no use trying to persuade the man otherwise, for he has seen the defective plumbing, and that is enough for him.

If the person is ignorant regarding plumbing, knows nothing about it whatever, the agent will not have this trouble with him. He will pay no attention to the plumbing, and defective or perfective, he will not stand back on that account. It makes no difference with him if there be no back venting or any thing in the place of it. It all goes, and if the house otherwise suits him he will rent it. This is the difference between those who have a knowledge of plumbing and those who have not, on the subject of renting.

It must be borne in mind that as plumbing has grown as it has in the past ten years, so has the importance of it gone out to the minds of those who are not plumbers in any sense. It would be difficult to have anything improve the way plumbing has and no one but those interested find it out. The fact is it begins in a small circle and widens out, like the wave on the pool when you pitch a gravel into it. There is no use trying to hide; you cannot do it. So the knowledge of plumbing rises in every city and widens out to the limits. So the people who knew nothing about plumbing three or four years ago now know enough to prevent their homes from being affected with defective plumbing work.

This is as we would have it. No plumber can well afford to do a bad job of plumbing even if he were allowed it. Besides what good does it do a man to stifle his fellow-men with gases which he would not breathe for anything on earth? It is the place of the plumber to do what he may to increase this knowledge of plumbing. He may have a job to do for one of these who have not yet gained a knowledge of good plumbing. He should instruct him in the knowledge of the art, material, until he could understand the value of good plumbing from bad, until he would choose the good even if the bad at reduced rates were offered him. There will be no better time for the plumber than when the merrits of his work are generally known, so that all men and women may be enabled to select the best work.

There is one thing true: Where there are people found who do not know what good plumbing is, it is owing to their ignorance of the work. They may never have had the subject mentioned to them, and may have gone on from year to year living in perfect ignorance of it. Whenever they want plumbing done for themselves, the plumber should not lose his opportunity of giving them some instruction on this important subject. It will cost him nothing and in the end will be a help to him, for the better the people are educated in the method of plumbing the better it is with the plumber. Never will he increase his business while the people remain ignorant regarding his work. But let them learn that the many ills of life are the direct effect of defective plumbing, and they will not want anything but the best.

There are one class of builders we should not have. These will be found to be the speculative builders. They do not want plumbing or any other work about the house done right. They are not looking for those kind of men. They are wanting the cheapest, and they generally get it. They may know all about good plumbing, how to put it in, all about the city ordinance and how to comply with it, and yet they do not want good plumbing. Cut these fellows off unless they do plumbing in accordance with the ordinance, or in accordance with the practice of good plumbing. Do not any work for them at all and prosecute any one who will. Remember you are among those who will benefit on account of there being a wider demand for good plumbing. You will reap a benefit from this demand greater than from anything else, and let it be so understood that you will all work in this direction.

NEWS AND NOTES.

S. P. Sticker, a mechanical engineer at Buffalo, has, it is claimed, discovered a method of making ice with gas and returning the gas to the main unimpaired.

A. J. Painter of Pasadena, Cal., has invented a naphtha motor in which the gas is exploded in cylinders by an electric spark from a battery. He thinks the motor can be used in street railway traction.

Experiments with the seed of the tree tomato, which A. J. Verlaque of San Diego, Cal., received from the east some time ago, demonstrates its advantages. Of his four plants, the most vigorous is now seven feet in height and is trimmed back and propped like a castor bean. The vegetable contains more meat and fewer seeds than the vine tomato and it bears fully as large and abundantly.

The drillers engaged in sinking a well for the Natatorium at Fort Worth, Tex., struck a flow of water which excels that of any artesian well known. The flow is 600 gallons per minute and is as clear as crystal. The well is 1,052 feet deep, with a 10-inch bore at the top, tapering to five inches at the bottom. Fort Worth can boast of the largest flowing well in existence, the largest hitherto known being at Bourne, Lincolnshire, England, which discharges 500,000 gallons daily. At Aire, in the province of Artois, France, from which province is derived the name of artesian wells, there is a well from which the water has continued to flow for more than a century, and at the old Carthusian convent at Lillers, there is another which dates from the twelfth century.

M. Eiffel is stated to be supporting a project for the erection of an observatory on the summit of Mont Blanc.

Paris requires every vehicle traversing its streets at night, if only a wheelbarrow, to carry a lighted lamp.

The Chairman of the National Board of Steam Navigation declared recently that travel on water in a steam craft was the safest in the world, inasmuch as only sixty-five persons were killed last year out of over 500,000,000 who traveled in 3,947 steam vessels.

Thornycroft said recently, that with regard to advances in ship machinery the engine question was worked out, and the boiler problem has to be brought forward.

One of the most prominent boiler makers in the country says that the tendency of the day among manufacturers is decidedly toward higher pressure boilers.—*The Iron Trade Review.*

Mr. Wiesner has published a communication tending to show that the products of combustion of gas have no action on paper and that gas can be used with perfect safety for the illumination of libraries. The chief difficulty, however, does not lie with paper, but with leather—it is the bindings which suffer. Exhaustive experiments upon leathers of various grades would be most valuable to librarians.—*Invention*, London.

No oil has been made that can economically lubricate all the journals of a mill. An oil running a heavy Corliss engine would not do to run a spindle or a fast revolving dynamo. The former runs slowly and has great pressure and strain on its journals, and consequently requires an oil which will not spread too quickly, but with low gravity and high viscosity. The latter needs a pure mineral oil, viscous and quick to enable it to enter into the closest parts of the bearing as rapidly as the speed at which it revolves necessitates.—F. H. Kukne.

The Poeller Physical Optical Institute of Munich has under construction an enormous microscope for exhibition at Chicago in 1893 which will magnify to 16,000, or, as ordinarily fitted, to 11,000 diameters, says the London *Pall Mall Gazette.* An electric light of 11,000 candle power is to be used for illuminating the image, which is to be projected on a screen. As the heat from this powerful light would derange the focus by expansion of the metal, an ingenious device is used to cool the metal. This is a small copper cylinder filled with liquid carbonic acid under a pressure of 350 pounds to the square inch. It is connected with the microscope in such a manner that an electric regulator automatically opens a valve and allows a drop of the acid to escape in a spray on the metal to be cooled; the liquid immediately evaporates and produces intense cold. The whole cost of the instrument is said to be nearly $10,000.

THE TRAP IN THE HOUSE DRAIN.

BY JOHN F. JARRARD.

The house drain trap had its origin back in the prehistoric era of plumbing practice. At that time, and in the small advance then made in practical sanitation, it may be said to have been a valuable appliance; and the man who originated it was, for a short period of time, a public benefactor, and deserves commendation. To a certain extent it was a bar to the passage of the foul gases of the sewer into the apartments of the dwelling, to be breathed by the inmates, and establishing in the house dangerously unsanitary conditions.

It must be remembered that the ventilation, now almost universal in our plumbing practice, was then a thing unknown and unthought of. The ventilating stack, now recognized by plumbers as the sheet anchor to the plumbing system of a house, had not yet entered into the thought much less the practice of plumbing.

The fixtures—water closets for instance—were, of course, a type of that early era above referred to. The odor of their memory, or the memory of their odor, still lingers with us. Of course those fixtures had traps placed somewhere under, or at least below them; but it may truthfully be said that no really sanitary work was done by anyone. Not that plumbers were, as a class, more dishonest than other men. They were simply ignorant of what ought to be done and of the proper way of doing it. For the most part they were men walking along an unknown way beset with dangerous pitfalls, honestly exploring and seeking for the true path by the light of dimest lanterns. The material at their hands, meager in supply and variety and poor in quality, had to be combined with the plumber's ignorance of sanitary laws, and cast together into the plumbing jobs of that time.

Looking back upon the work of the early plumbers by the light of present sanitary knowledge, every one must admit that it was abominable. Then it was that the trap in the house drain was a blessing to the household by barring, as it did, much of the foul air of the sewer from entering the dwelling. But the admitted fact of its former usefulness, does not argue its proper place in the house drain under the changed conditions of to-day. Now, no man has a right to call himself a plumber, who, with the material at his hand, and the sanitary light of the present time, cannot and does not, by his work, guard the household against the possibility of unsanitary conditions reaching the house through the plumbing, without the use of the dangerously unsanitary drain trap.

I take the ground that there should be no obstruction whatever placed within the house drain, to cut off or in any manner hinder the free flow of air up or down through the house drain, whichever way it may choose to travel, through every pipe of the plumbing system of the house, from the street sewer to the roof of the building.

"To prevent the gases of the sewer passing into the house," is the favorite and only argument in favor of the drain trap.

Think of it, conscientious, skillful and intelligent plumbers, what do you say about the gases of the sewer getting loose into a dwelling through your work? You know, when you leave your job that you may safely challenge every devil in the sewer to get into the house through the pipes and appliances which you have placed there.

Good material, knowledge, conscience and skill, and an honest hard-headed old plumber to inspect the work, and we may safely give the pipes a chance to breathe, without a plug in their lungs.

Perfect freedom from the street sewer to the house tops for currents of air—and the more the better—to chase each other through the pipes of the plumbing system; every trap ventilated from its crown by as large a pipe as can properly be used in the place, and always as short as you can make it, and the shorter the better generally.

By this freedom of the drain from the obstruction of the trap, air is driven through the pipes by advancing columns of water at each discharge of the tanks and fixtures, and pressed forward into the street sewer, and not puffed through the "fresh air pipe" under the noses of innocent and unsuspecting people. By this arrangement a most perfect ventilation is kept in operation through all the pipes of the house plumbing. The fixtures are discharged, and the advancing water column drives the air in the pipes before it into the sewer, and fresh, clean air will follow down the stack from the house top, at the command of nature's abhorrence for a vacuum; and besides this forced circulation of air through the pipes, there will also be kept up a strong gravity circulation. Air will be found to travel with much constancy in at the manholes and out through the ventilating stacks of buildings. The writer has spent much time in careful observation and experiment upon this point and knows what he is talking about. The trap in the house drain insures and secures an abominable and stinking sewer. A sewer must breathe, or it will be a foul and dangerous neighbor. It must draw its breath in through the manholes and exhale it through the house drains, and it will do it if they are not obstructed by traps.

And again, every intelligent plumber knows that the drain trap retards the rapid flow of sewerage through the house drain, often leading to its obstruction at that point; a condition which gives no warning until an overflow takes place, sometimes through the fresh air pipes, and often through the fixtures on the first floor. In either case bringing about conditions both abominable and dangerous. Give the house drain a sharp pitch, with no dams across it, and you will give it a sharp, cleansing flow that will ask no help to keep itself clean.

The trap in the drain would, in the opinion of the writer, soon loose its place, only for the place of compulsion which it occupies in so many city ordinances. Many of these ordinances have originated with city engineers and attorneys. In the main these

have been intelligent men in their own callings, and have even done much of this unfamiliar work well; but being, of course, largely ignorant of the work they had in hand, they were always tempted to copy from ordinances of other towns, and could not discriminate between that which was good and that which was bad in a plumbing ordinance; and to make the matter worse these men are generally under the delusion that plumbers are opposed to laws regulating their business, and therefore, not safe men to be taken into the councils of plumbing ordinance making. Herein they have greatly erred. By taking intelligent plumbers into their councils, they will find their work less likely to need overhauling in the near future.

THE EDUCATION, POSITION AND DUTIES OF PLUMBERS.

(Concluded from page 236.)

The greater part of the skilled labor of this country is performed in factories, engine works, shipyards, and similar establishments under the direct supervision of a foreman, overman, shop manager, and other responsible person. All that is required of the workman is manual dexterity, and this is not to be gained in the technical class. Generally, there is little room for thought or originality. All the thinking has to be done by the few who are responsible for design or management, and, unfortunately, it is sometimes believed to be to the interest of the employer even to discourage thought on the part of the workman. In such cases there is still room for the technical instruction in order that the workman may take an intelligent interest in his work, and that the few of exceptional ability and ambition may qualify themselves to occupy positions of responsibility later on. It may fairly be debated whether in many trades the ordinary journeyman would not do better by devoting his leisure hours to the study of literature or fine art, than by employing them in the acquisition of the scientific principles and technology of his craft. Of course, much of the plumbers' work, like the engineers', is done in the shops under the eye of the foreman; but in his most important work the sanitary plumber is generally his own foreman. Accompanied by an assistant, the plumber enters the dwelling house, and henceforth the health and, perhaps, the lives of the household are in his hands. Efficient inspection after the work is done is practically impossible. The journeyman plumber makes his own diagnosis, applies his own remedies without even nature to help him, and finally conceals his work so that the efficiency of his treatment can only be tested by time.

In these circumstances, it is obviously a necessary safeguard to the public that they should be provided with means of distinguishing those who have been properly educated, and have given proof of their knowledge and practical skill.

The conduct of technical classes, under the direction of committees composed chiefly of members of the plumbers' craft, the publication of a graded syllabus of instruction covering the whole ground required by the apprentices, and including all the branches of science which bear upon the craft, the granting of a series of certificates on the results of examinations, with the final certificate of registration regarded as proof both of practical skill and scientific attainments, while essentially pioneer work, mark the greatest advance which technical instruction has yet made in this country.

THE POSITION OF THE PLUMBER.

Every calling which intimately concerns the health of the community should be under statuary enactments regulating the qualifications and practice of its members.

Thus a doctor must furnish proof of a long course of study and of the possession of the necessary skill and knowledge and attainments before becoming a registered medical practitioner. A pharmaceutical chemist has to give evidence of his capacity as a compounder and his acquaintance with drugs and the preparations of pharmacopœia. A dentist also has to submit to a long course of instruction and to pass an examination before he receives his diploma entitling him to the privileges of his position.

The plumber, who is at least as intimately associated with the health of the public and the individual as those forming any other vocation, is in the uniqne position of being under no statutory regnlations or obligations. Apart from the course of instruction formulated by the Worshipful Company of Plumbers, there is no curriculum of study arranged for the plumber, no prescribed term of work at the bench, no compulsory examination in theory and practice to be passed. There is no rule he has to conform to, no wholesome disciplinary powers he stands in fear of. He is in the unfortunate position of being "law unto himself." Moreover, he is beset in a very special way by temptation. On the one hand, there is the rage for cheapness, which induces masters to tender for work and journeymen to do work at a price for which honest, conscientious work cannot be done. On the other hand, there is the remarkable ignorance of the ordinary householder regarding plumbing and sanitary fittings. He does not pretend to understand them nor desire to understand them—all he requires is that everything shall be hidden away out of sight. To expect a man working under such conditions to be always honest, intelligent, and skillful would be scarcely reasonable.

While there is no prescribed training for the plumber, no test examination all must pass, it follows that the genuine plumber must compete in the same market with the untrained and untrustworthy. Men who have never served an apprenticeship or undergone any technical training offer to do plumbers' work and obtain employment at laborers' wages, to the manifest injury of the public and the plumber. What the genuine plumber, who has spent much time and money in qualifying himself, wants, is some certificate or voucher giving him a recognized position and distinguishing him from the unqualified man. What the public desires is similar—a distinctive mark telling of fitness of training by which they will know on the best authority the masters and men who are really plumbers and may be trusted to do efficient, honest work.

The very serious extent, and the continual spread, of the sanitary evils associated with defective plumbing and drainage work have, in recent years, so far engaged public attention that the great body of the medical profession, and the sanitary authorities of the United Kingdom, have declared it to be essential to the protection and preservation of the health of the community that plumbers should be sufficiently trained and educated, and should pass qualifying examinations as to their knowledge and practical skill before engaging in those branches of plumbers' work which effect the sanitary condition of dwelling houses and other buildings.

Sir Charles Cameron, M. A., Medical Officer of Health for Dublin, well expresses the opinion of the medical profession and of expert sanitarians on this topic. "It is now desirable," he says, "that persons who profess to be plumbers should be tested as to their competency to do the work of a plumber. The sanitary state of a house largely depends upon the provision made for getting rid of waste water produced in it, and if the water closets and sewers employed to get rid of those matters are constructed by mere handy-men, laborers, &c., they are likely to be defective and injurious, rather than beneficial to health."

As regards the importance of the position of the plumber, the weighty words of Prof. Armstrong, of Edinburgh University, are well calculated to arrest attention. He said:

"No one who has the slightest acquaintance with the history of sanitary science, or with the nature and extent of the incidence of disease, could for one moment entertain a doubt as to the supreme importance of the position which sound and intelligent plumbing occupied in relation to the health of every household; for according as the plumbing in a house was good or bad, thoughtfully or carelessly done, so was it calculated to make or mar the health of those who dwelt in it. With such heavy responsibility, and with such enormous interests at stake, it was surely not unreasonable to demand that plumbers who were entrusted with work of this kind should be just as carefully and systematically registered as medical men and lawyers were required to be."

It would be easy to multiply quotations from skilled workers and writers in this connection, but there is no need to do so. When it was thought that public opinion was sufficiently advanced to support the action of the medical profession and the leaders in the plumbers' craft, the chief sanitary authorities and others united with the Worshipful Company of Plumbers in establishing a system of training and registration in Great Britain and Ireland. After some preliminary meetings in the autumn of 1884 and in 1885, this system was commenced and the register for duly qualified plumbers opened in March, 1886. Ever since the registration movement has been making steady progress, and it is felt to well deserve the hearty suppport of the community at large.

In this matter public opinion has been supported throughout the United Kingdom by members of the craft. The plumbers themselves are anxious to raise their craft into the position it ought to occupy in the estimation of the world, and they well know that this can be effected only by the weeding out of ignorance and dishonesty. The formation of District Councils for the registration of plumbers in the most important divisions of the country indicates the feeling of the members of the craft with respect to this question. Most of the District Councils comprise, besides masters and operative plumbers, members of local health committees, medical officers of health, leading physicians, and architects, and other representative persons. The co-operation of local sanitary authorities is of the utmost importance in the development of any system of registration, and the registration committee may in many ways render valuable aid to the local authorities. As stated by Dr. Alfred Hill, the medical officer of health for Birmingham, "the health committee want really to make plumbers their technical assistants."

Opportunities are afforded men of proving their knowledge and skill before competent examiners. The certificate they receive, if successful in the examinations, gives them a recognized standing and position not before attainable. It is important to add that a certificate thus obtained may be withdrawn from anyone who shall be convicted of doing work dangerous to health or distinctly in contravention of what has been undertaken.

THE DUTIES OF THE PLUMBER.

Foremost among the duties of the plumber is that he must be honest. This, it may be said, is demanded of all workmen, but in view of the importance of the work committed to the plumber, his absolute trustworthiness is essential. The health, it may be the lives, of many may depend on the conscientious discharge of his duty, his honesty must be therefore altogether above suspicion.

Next it is the duty of the plumber to be intelligent and sharp and in the possession of all his faculties. A man of third-rate abilities is fitted for many vocations in life, but he will not make a plumber. It is the duty of the plumber to be quick-witted and full of resource, and to have his organs of special sense in good order.

In the third place the plumber's duty is to be well trained. His honesty and intelligence, even if he has also considerable manual dexterity, will not make him a craftsman.

For that a long training is needed, and the training must be given by a competent and experienced plumber. A man not carefully and properly taught, however able, is not a plumber.

Lastly, the plumber's duty is to exercise his judgment and common sense and do his best. Good judgment is constantly required by the plumber, and the more it is exercised and trained the more reliable it will be. As regards common sense, perhaps some of the most disastrous mistakes ever made have been due to a want of this. In no trade in the world is good workmanship so essential as in plumbing. The duty of the plumber, therefore, in planning or executing work is to spare neither thought nor pains, but do his best.

Every plumber who does his duty by being honest, intelligent, and well trained, and who exercises his judgment and common sense, is fitted to be, and will be, the technical assistant of the sanitary authority. Such plumbers employed in any district, and such plumbers only, will insure, so far as it falls within the province of the highest scientific development of the plumbers' art, that every household shall enjoy the primary conditions of health uncontaminated air and water, and shall possess every facility for the removal of impurities as fast as they are produced.

CLOW & SON'S TRAP.

Referring to the subject of our new N. P. Copper Trap, shown you a few days ago, we have to say that about a year ago there was brought to our notice, a method of depositing copper by galvanic action, which, if perfected, would enable us to manufacture tubing and other hollow articles in a practical manner.

It was decided first to adapt it to traps and after a great deal of experimenting and expense we are enabled to produce them for the trade. While the process is in theory an old one, yet in its adaptability to the purpose it is new, and for various reasons is not made public; however the result is an article which has, we think, great merit, and meets a demand of the trade, for a neat durable and inexpensive fixture for open work. The symmetrical outlines of a true S trap are preserved and it is conceded that the S trap with vent, is the best made. The body is of pure copper and all connections are of first class brass united without solder or brazing. There are no seams and they can easily stand a pressure of one hundred pounds per square inch. It is believed they will last a lifetime. The joints are ground, thereby saving annoyance and danger arising from washers' drying and leaking when least expected. It is a complete trap with basin plug, wall plates, and pipes to the wall. We manufacture both S and half S, patent or common overflow, and adjustable to various heights of bowl also without vent if needed. Why we claim our goods superior is their general neat and attractive appearance, their durability; copper being of all metals, lead alone perhaps excepted, the least effected by acids or alkalies; the copper is unusually tough and can be bent or hammered double without breaking. The complete manner in which they are put on the market is a great advantage, as it enables the plumber to readily connect them. They are not so heavy as to be a constant drag on the basin and can be easily detached by anyone, when necessity requires. Everything is interchangeable and enough combinations are made to allow it to be used, whenever needed.

The price is as low as the cheapest; they have met with the approval of every architect, jobber and plumber to whom they have been shown.

We trust that your articles on this subject may be instructive to all your readers. Yours very truly,

JAMES B. CLOW & SON.

THE PERFECTION FILTER.

This filter is being placed on the market by the Perfection Filter Company, of 144 Thirty-first street, Chicago, with flattering success. It is to be used in connection with the city water supply, and is designed for private residences, factories, distilleries, breweries, etc.

The "Perfection" is simply screwed on the water supply pipe like a common faucet. It has two faucets, from one of which water is drawn direct from the supply pipe, and from the other perfectly pure water is drawn.

There is no trouble in keeping the "Perfection" clean, because the filter cleans itself by operating the hydrant faucet; also it is not necessary to refill the filter, as the filtering material will last for a number of years without being discharged. Besides all this the "Perfection" costs about one-third the price paid for filters, which do not nearly so satisfactory work as the "Perfection." Everybody who is interested in this should write for a circular and see what the firm guarantees.

There is scarcely any water that is not better by being filtered. No home can boast of having all the modern improvements if it has not a Perfection filter in the place of the cold water faucet. It is so low in price that even the poorest are able to drink clean, healthy water. It can be set on the faucet now in your houses with no cost, if the threads on the filter are the same, and with but little if the threads are dissimilar. Try one and be convinced of their utility.

REVIEWS AND NOTES.

In praising the more conspicuous features of that unique magazine, the *Review of Reviews*, its friends sometimes forget to give due prominence to what, after all, are perhaps the most valuable;—namely, the pages of small print at the end of the periodical which contain full classified lists of all the new books that have lately appeared, with bits of running comment on them; full lists of the contents of all the principal periodicals of America, England, France, Germany, Italy, Belgium and the Scandinaval countries; and finally a complete index, which under one alphabet lists the important articles that have appeared in the previous month in every important periodical published in the English language. These departments require great care and labor in compilation, and are invaluable for purposes of reference.

Our *Little Men and Women* is a delightful number of a beautiful magazine for the youngest readers. There are pictures in

plenty, large and small; short stories of a page or two, mostly illustrated; verses to please the little folks--and all on fine paper, large type. This magazine cannot fail of being very interesting and helpful to the children whose ages range from five to nine, and it is but $1 a year. D. Lothrop Co., Publishers, Boston.

Mrs. Mary Hallock Foote, who first came before the public as an illustrator, and later as the author of "The Led-Horse Claim" and other novels of Western life, has written a new story which will be one of the serial features of the coming year of *The Century*. Mrs. Foote has chosen a field unhackneyed in fiction, the irrigation schemes of the Great West. "The Chosen Valley" will be illustrated by the author.

CONVENIENT TO HAVE ABOUT.

Zinc is best cleaned with hot, soapy water, then polished with kerosene.

Wire rope is said to be as pliable as new hemp rope of the same strength.

Recent experience in cold storage shows that different articles of food require different degrees of temperature for their preservation, varying from 33 degrees Fahrenheit for eggs to from 15 to 26 degrees for poultry and various kinds of game.

To prevent screws employed to join machinery from becoming fixed and difficult to remove from oxidation, the *Monitor Industrielle* recommends a mixture of oil and graphite, and says it will effectually prevent screws from becoming fixed, and protect them for years from rust. The mixture facilitates tightening up, and is an excellent lubricant, and reduces the friction of the screw in its socket. Carbon, of which graphite is largely composed, is the best known lubricant.

The following process is noted from France for hardening plaster, so that it may be used for flooring, as wood and tile are at present. About six parts of good quality plaster are intimately mixed with one part of freshly-slaked white lime finely sifted. This mixture is then laid down as quickly as possible, care being taken that the trowel is not used on it for too long a time. The floor should then be allowed to become very dry, and afterwards be thoroughly saturated with sulphate of iron or zinc—the iron giving the strongest surface, the resistance to breaking being 20 times the strength of ordinary plaster. With sulphate of zinc the floor remains white, but when iron is used it becomes the color of rusted iron; but if linseed oil, boiled with litharge, be applied to the surface, it becomes of a beautiful mahogany color. Especially is this the case, if a coat of copal varnish be added.

A good cement for celluloid is made from one part shellac dissolved in one part of spirits of camphor, and three to four parts of 90 per cent alcohol. The cement should be applied warm, and the broken parts securely held together until the solvent has entirely vaporated.

The drilling of hard steel will be facilitated by the use of a solution of gum-camphor and alcohol.

Experiments have shown that nickel may be effectively rolled upon soft steel plates, which are thus made valuable for lamp reflectors and other purposes.

To find the number of bricks in a building: Rule—Multiply the number of cubic feet by 22½. The number of cubic feet is found by multiplying the length, height and thickness (in feet) together. Bricks are usually made 8 inches long, 4 inches wide and 2 inches thick; hence it requires 27 bricks to make a cubic foot without mortar, but it is generally assumed that mortar fills 1-6 of the space.

After a stove has been blackened it can be kept bright and clean a long time by rubbing it over with old newspapers every morning. Rubbing with paper is also an easy way of polishing up the outside of a tea kettle, coffee pot and tinware generally. For cleaning mirrors, windows, lamp chimneys and the like, paper is the next best material to chamois skin, with which housekeepers in the country are seldom provided.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

People in looking about will observe in the past few days, that there has been a marked distinction of the smoke of Chicago. The chimneys that have been permitted to pour forth their smoke have gradually taken in their signs of gloom and quite a change is apparent. How long this will last is not at this writing known, but we hope to see it last. We hope also to see others which have not yet stopped to make smoke, turn in as the others have done and make our city clean and healthful. It is a desire devoutly to be wished, and there is not a man, woman or child, but what would be glad to see that happy day come.

As we have frequently said the smoke abatement is not the work of a day — nor should it be the work of a life time. It gains day by day, but the gain should be observable. It should be seen to be on the aggressive and the smoke seen to become less offensive. With all this in view we congratulate Smoke Inspector George, and will speak for him a good word whenever we find room for one. That he has made headway in this particular case is apparent to all who have the interests of the city at heart enough to observe. He has the opportunity of doing more and we firmly believe he will do it. The smoke nuisance is not like a common nuisance of anything else. It is peculiar in itself. It has certain interests to be looked after, which are not found possessed by anything else. The nuisance of smoke is not on the ground where it can be removed. It is in the air and the way to remove it is not to make any. This must be done in the furnaces where the fuel is burnt. The most perfect combustion becomes the least amount will be the smoke, and when combustion of the fuel becomes complete, the smoke will entirely disappear. We are glad to observe that the smoke inspector has succeeded in doing this to an observable degree, and, as before remarked, we will be pleased to see him continue his fight till all the offenders are made to use some preventor.

Cincinnati is covered with smoke and the ordinance is not sought to be enforced. I do not believe I ever saw the city so smoky, and as I looked out upon that fair city blackened and filthy with smoke, I thought here would be a great field for some agent of a good smoke-preventor device. Stand almost any place in the city, look out in almost any direction and the black smoke can be seen at almost all times of the day. Nothing is being done to prevent it. There seems to be no idea that the smoke nuisance can be prevented or that anyone wants it prevented. If they had a Smoke Inspector appointed with full power to act as we of Chicago have, they might see some improvement in the city in a short time. We do not know how it would do, but if we were in that business we would establish an agency there, and see what could be done in the way of getting people to understand what would be the result of preventing smoke. They do not seem to know that it can be prevented. At least there is no effort made in that direction. It is surprising to me to see as nice a city as that so full of smoke when it could be so easily prevented. They could get a smoke preventor or two and have them tried, and then they would know what they might expect to accomplish.

Other cities where the movement has been put into operation write that they feel hopeful that they will succeed: but they have some stubborn city officials and councilmen to deal with, and cannot hope to accomplish much till they get them out. This will require the vote of the people, and they should agitate the question of smoke prevention for all it is worth, and it will be found to be worth a great deal. No time should be lost. It should be kept up and every voter informed on the question of smoke abatement. Then when the election comes off let them get pledges from the candidates, elect them and hold them to their former promises regarding the abatement of smoke. The abatement of smoke is seen to be no little question. When everything is ready an ordinance adopted and all things set to work, then the time for abatement has fully come. Then is when the preventors are called on, and this is when the enforcement of their use becomes no child's play. This is the fairly hardest part of the matter. Something is wrong here, something wrong there and no time is set for the actual prevention of smoke. Then the weak-kneed inspector is not the man wanted. He should be a man who could go out and see that the law was enforced — that every item of it was fully put forth in its original strength. With this kind of an inspector the smoke will disappear and the city will become clean, and the walls of other handsome buildings, the dwellings, and everything in the city will put on a different appearance and so remain.

SINGLE TRAP SYSTEM OF HOUSE DRAINAGE.

William S. MacHarg, Engineer Water Supply and Sewerage, World's Columbian Exhibition, Chicago, says the *Engineering Record*, referring to our criticism of Mr. Anderson's paper on the single trap system of house drainage in our issue of July 4, writes:

"Persons who have had much experience in the direct control of air currents know that they are very uncertain, and know that they are likely to be changed by slight local causes. As a matter of experience I should say that it is impossible, in a building of any size, to control the flow of air through the various plumbing fixtures located in various positions and at various elevations, in rooms some of which have open windows or fire places with direct connection with the outer air, and some of which are perfectly closed. The slight effect of the hot chimney or of a gas jet in main vent on connections with various sized openings for admission of air is a very small factor in the proper ventilation of wastes and sewer.

"I know that with some the system which will do away with traps or fixtures is considered an ideal system. I have seen it put in practice once upon a residence, and while it never in this instance was given a fair trial, yet the sudden conversion of the architect using it was very amusing. It was intended in this instance that the range chimney should supply the motive power to the main vent of the house. The building was ready for interior finish about the beginning of November, and the glass was in all the windows when the carpenters began their work. As soon as they had started fires in the fire-places, word was brought that the sewers were discharging sewer gas all over the house. I was called in to examine it, and while I recognized fully that the system was not properly complete, as intended, yet my advice was that they immediately put traps on all fixtures. As a matter of fact the sewers were supplying all the air for the maintenance of fire in the fire-places. The deduction from this, although it is admitted that the system was not properly operated, is, that the slightest increase from draught in any room is likely to divert the current of air to that room.

"I know of an insane hospital in which a similar system is used, and from my knowledge of construction in such hospitals I am positive that in case of typhoid fever in one ward it will pass through all the wards, for, although there is an apparent draught at all times down the fixtures, it is certain that slight variations in pressure will produce discharge of air into various wards. In another insane hospital I have protested against the idea that a building of 800 or 1,000 feet long can be successfully ventilated through the fixtures in this way, even although conditions in such a building are under the direct control of physicians and mechanics, and I am glad to say that my advice was accepted. The fact that, under ordinary conditions, such a scheme seems to work, and works ordinarily upon being inspected, is no proof that with zymotic disease in any part of the building it will not be distributed throughout the wards. I think that this conclusion will be evident to all who have tried to ventilate buildings solely by exhaust, or who have had experience with the flow of air through openings of various diameters and pipes of varying lengths, in such positions that exterior circumstances may affect the flow."

MOBILE, ALABAMA, WANTS SEWERS.

The Mobile *Register* says: There does not seem to be any question as to the desirability of having in Mobile a complete system of sewerage. The practical advantages of sewerage have been demonstrated in so many places that there can be little opposition to a movement looking to the establishment of a system of sewers here. If we were disposed to doubt that sewers will produce the hoped-for sanitary improvement, we can not shut our eyes to the fact that if we expect the city to acquire a good reputation abroad we must take steps to put the city abreast of the times. There is a large and influential class of people living in the Northern states who believe as firmly in the efficacy of sewers as they do in the Christian religion. There will be little use in telling such people that Mobile does not need sewers. Besides our health record will show that what we say is not true. Mobile certainly is in great need of sewers.

Take for example the experience had with a gentleman from the North who visited this city last winter. He was much pleased with Mobile. He liked our climate and the general appearance of our city. He proposed to buy land and build him a winter home here. He went out to look at the land and was upon the point of making a purchase, when he happened to enquire about the system of sewers in use here. When told that there were no sewers here, he said: "That settles it! I do not propose to live in a place that has no sewers." This gentleman's view of the situation is the view that every Northern man holds. If we expect to have industries established here we must improve our condition. We do not pretend that we ourselves are going into the manufacturing industry. We have plenty of money, that is to say, there is plenty of money here invested in bonds and other securities. As a people we do not understand industrial work. We made our money in trade and commission and we cannot, it seems, learn new ways of making money. We expect that Northern men will come here and establish cotton mills, refineries, iron works and such like, and, if they will teach us how to manage such enterprises, we will then put our money into such enterprises or establish like enterprises of our own. The first step in this direction will have to be made by men who are acquainted with the business. This much seems to be conceded by the people and is sustained by the experience of the past few years.

To get these Northern men to come here, we must make the city healthy. We claim that it is healthy enough for us. We are pointing with pride to our success in keeping out the yellow fever, forgetting that we have here in our midst the source of many enteric fevers which per annum carry off almost as many people as would be taken by a moderate yellow fever epidemic. Why not banish this cause of death? Why not at the same time improve our sanitary condition so that even should yellow fever happen to slip past our barriers, we would not be in mortal fear of a spread here of the disease. Until this fear is done away with, and until we establish Mobile's reputation as a healthy city, we may advertise in vain our other advantages. Mobile may become a pleasant resort for a few months in winter, but what we want is an increase of industrial population—a population that will remain here all the year round. It must be recognized, once for all, that the important element to be considered in industral matters is labor. The laborer employed in manufactories is a permanent and steady factor. It is this element that has enabled the New England factories to hold the supremacy in this country, in spite of their distance from the source of the supply of raw material. It is this element that is lacking in the South; and the reason is that Northern people believe that the South is the peculiarly unhealthy portion of the United States. The complaint of the lack of skilled labor comes from such centers even as Augusta, but that city is specially favored. It does not have to contend against an unhealthy record as Mobile does. If the lack of steady laboring class is a source of complaint in Southern towns where industries are already established, it will prove to be a prohibition here, where we cannot guarantee the laboring class can be kept reasonably in health, and where, by reason of the absence of sewers, we are believed to be threatened with devastations by foreign diseases, against whose invasions we do not know that even our costliest precaution will prove efficacious.

We need not multiply words to enforce our argument. We use plain terms in speaking of our condition. Every one who will take the trouble to think upon the subject will acknowledge that we speak the truth only. We have got to face the situation. We have got to build a system of sewers. How this shall be done is a fit subject for earnest consideration.

HOT WATER HEATING.

The September number of the *Engineering Magazine* contains a most interesting article on the heating of houses and public buildings by hot water and steam. It enters in a scientific and exhaustive way into the several points of difference between these two systems of heating, which are the subject of considerable discussion and sometimes of controversy. The following extracts will serve to exemplify the tone and style of the article:

"The amount of heat carried by a pound of steam, and the rapidity with which steam circulates through pipes are sometimes made to appear important advantages as compared with the less heat carried by a pound of water and the slower circulation of the latter, effected solely by changes in specific gravity.

"While by virtue of its latent heat it forms in proportion to its weight the most admirable carrier of heat known to science; and by reason of its expansibility its rapid circulation in any direction is easily effected, yet the very fact that it is steam imposes a rigid limit of temperature that unfortunately cannot be passed. It never can be cooler than 212° under ordinary atmospheric pressure, this pressure being a condition of all practical steam heating as applied to buildings. The necessity of some unbalanced pressure to secure circulation compels even a higher temperature than this, the temperature corresponding to the average low pressure maintained (5 lb. per square inch above that of the atmosphere) being almost exactly 228° F.

"Time and again attempts have been made to reduce the temperature in radiators, by means of pressure reducing valves, and regulating valves, but the fact that below 212° F. there can be no steam and circulation ceases has barred any useful progress in this direction.

"Within the last decade there has been a remarkable increase in the popularity of hot water heating, due to a combination of causes. There is a much larger proportion of our population possessed of means to purchase superior appliances than formerly. The extending taste for good solid reading, has largely increased the stock of general information upon subjects pertaining to sanitation, among which the heating and ventilating of homes occupy a most important place.

"While a pound of steam in condensing to water can give off 966.5 thermal units, and a pound of water in cooling from 180° to 70° can give off only 110 thermal units, it has been shown above that a pound of steam as ordinarily used for steam heating occupies a space of 20 cubic feet, or a space that would hold over 1,200 pounds of water heated to 180° F. A simple multiplication shows this volume of water to contain over 130,000 available units as compared with 966.5 units in the steam filling of the same space. It forms therefore a storehouse for heat to which steam is in no way comparable, and the velocity of its circulation may be immensely lower than steam and yet it is able to convey all and more than the radiators can extract from it. Hence it is that while the temperature of a room heated by steam falls rapidly whenever the fire in the boiler gets low, the water continues its action for a long time without any perceptible diminution. The sudden and violent fluctuations to which temperature produced by steam heating are liable are unknown in hot water heating. This is its crowning advantage. Uniform heating of buildings worthy the name "uniform" has never been reached by any other means.

"But there is this important and fundamental distinction between the action of a steam coil or radiator and one which takes its heat from hot water, that whereas, as has already been shown, the former can only operate at the temperature of 212° F. and upwards, the latter can operate at any temperature whatever that is higher than that of the air surrounding it. Thus if air at 60° F. envelopes the radiator and the apparatus is adjusted to heat water to 180° F. as its maximum, there is a range of 120° F. all through which the hot water radiator can work, and this range is perfectly controllable. In mild weather just the heat needed can be supplied and no more. As the weather gets colder the heating can be increased to meet the exact requirements. Compare this with a low pressure steam apparatus adjusted to carry steam at 228° F. as its maximum. It canot work below 212° F., hence the difference between this and the maximum temperature is the range through which any variation is possible. The hot water heating apparatus is therefore adapted to all climatic conditions, while the steam heating radiators, if proportion to the demand for extreme cold weather, are and must remain too powerful for any weather much warmer than the extreme. For mild weather, when the steam heat becomes unbearable, the remedy is to open the windows and waste heat by these avenues to intersellar space, or to shut off the radiators and send the waste heat out of the chimney, while the room cools down. In steam heating a condition of health and comfort is exactly reversed. The range of temperature variation which should be confined to the heating apparatus alone, is transferred to the apartments, which are now too cold and anon too warm, instead of being heated to a uniform, pleasant and wholesome temperature."

The entire article, together with Mr. Allen's article on heating and ventilation, from the April number of the *Engineering Magazine*, is published in an attractive little volume with handsome illustrations. It is apparently designed for distribution rather than as a commercial venture, as it is announced to be sent free by mail on receipt of ten cents. It is to be had from the Sanitary Publishing Co., P. O. box 2202, New Vork.

PLUMBING NOTES.

We have received from Thos. Kelly & Bros., 75 Jackson street, Chicago, catalogue of the Kelly Self-Acting Water Closets, Noiseless Push Closets, the Kelly Stop and Waste Cock, the Kelly Self-Acting Urinals, the Kelly Water Cushion, the Kelly Self-Closing, Anti-Freezing Hopper Cock, etc. As thirty-five thousand of their closets are in use throughout the United States, Mexico, South America and Canada, they are able to furnish references in any locality. In the city of Chicago where there are six thousand of their closets in use, they give a page of the most noted places where they are employed. The Kelly Self-Acting Water Closet for high pressure (over 15 pounds to the square inch), may be described as follows: When the seat is occupied the inlet side of the valve opens and the waste or closet side of the valve closes tight. The water then passes up to the tank and fills it as far as the pressure of the water can compress the air. When the seat is vacated the inlet side of the valve closes and the waste or closet side of the valve opens. The compressed air then drives the water into the closet with great force, thoroughly scouring the bowl, trap, soil pipe and drain. For the low pressure (less than 15 pounds to the square inch), is the same, except that the Kelly Air Valve is used on top of the tank to let the air out or in, but allows no water to escape. The description of valve may be given as follows: The balls are rubber, and by moving the lever one ball shuts and the other opens. There is no friction or wear to the balls. If it was possible for them to wear it would not affect the working of the closet. Even if half of each ball was cut off, the lever would bring them to their seats. The advantageous points to this closet may be noted: It is noiseless, no overflow, no sweating or dripping, less room, cleanliness, no repairs, no freezing, no smell, low ceilings, no waste, only one pipe, an ornament, powerful flush, no stopping up, etc. The other closets and fixtures shown in this catalogue are well worth considering, and we bespeak for them a good trade wherever they are introduced.

We were delighted last week; a representative of Anson & Pratt, of Hastings, Neb., called on us. Anson & Pratt are in the plumbing, gas and steam fitting business and report good work.

Fire at an early hour the 24th inst., in the manufactory of the Weir & Craigo Company, plumbers, caused a loss of $50,000 on the stock, and $10,000 on the building, fully covered by insurance.

Hoffman & Co., of Leavenworth, Kan., have received the contract to put in gas and water fixtures in Paul Haven's Broadway residence.

We have a letter from the plumbers of Madison, Wis., stating that we spelled the name of their president wrong in last week's issue. The name should have been E. F. Ledwith. We are much obliged to our Madison plumbers for the kindness they manifest in thus correcting matters which are wrong.

The following firms of this city gave a share of their patronage the past week to the well-known firm Thos. Kelly & Bros. on their water closets: E. Baggot, Adams street; Gay & Culloton, T. J. Gilmore, T. J. Brosnan, John Weppner, J. F. Alles Bros., D. J. Rock, Thos. F. Rock, W. D. Kelly, Alex. Murray, E. Baggot & Son, Michigan ave.; Hugh Watt, C. J. Herbert.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Ashland ave., N. of Henry street, George Groll, 886 N. Halsted street.

822 Allport ave., F. Meek, 485 W. 18th street.

140 Ashland ave., A. Murray, 811 W. Madison street.

560 Ashland ave., O. Heyman, 300 Washburn ave.

107 Bingham ave., Garner & Bahn, 1740 Milwaukee ave.

88 Baxter street, Wm. Bletsch, 930 Sheffield ave.

8813 Buffalo street, Brunt Bros., 9115 Erie street.

Blue Island ave. and 21st street, Kretchman & Kurtz, 379 W. 18th street.

3127 Cottage Grove ave., Max Minzesheimer, 512 N. Clark street.

9230 Commercial ave., Tully Bros., Houston ave. and 92d street.

356 Chicago ave., W. J. Miller, 387 W. Chicago ave.

408 Clybourn ave., Bayha & Bachman, 124 Clybourn ave.

Central Park ave., S. of 16th street, F. Meek, 485 W. 18th street.

346 Cortland street, Harvy & Mose, 665 North ave.

4313 Cottage Grove ave., Wm. Sims & Sons, 588 W. Madison street.

464 California ave., S. Smith, 469 California ave.

203 Carpenter street, Nelson & Cederholm, 87 W. Ohio street.

263 Congress street, R. Arnold, 407 W. Division street.

California and Jane streets, C. Breyer, 833 Milwaukee ave.

83 Cleaver street, C. Breyer, 833 Milwaukee ave.

Dania and Lamoyne aves., Harvy & Mose, 665 North ave.

7100 Dobson ave., J. Thompson, 272 55th street.

626 Dania ave., Nelson & Cederholm, 87 W. Ohio street.

4918 Dearborn street, E. & T. Sanford, 5103 State street.

790 Davis street, C. Breyer, 833 Milwaukee ave.

Division street, C. Breyer, 833 Milwaukee ave.

Dudley and Webster streets, T. Foley, 646 Noble street.

84th street and Greenburg ave., Webster, Crombie & Henderson, 9243 Commercial ave.

85th and Mackinaw streets, Webster, Crombie & Henderson, 9243 Commercial ave.

9018 Erie ave., A. Thompson, 9138 Erie ave.

82d street and Buffalo ave., Tully Bros., Houston ave. and 92d street.

Evans ave., S. of 66th street, M. Anderson, 69 35th street.

533 18th street, C. Uher, 524 W. 18th street.

86th street and Arthur ave., Brunt Bros., 9115 Erie street.

80th and Coles, S. Wilkes, Jr., 130 78th street.

Ellis ave., J. Kotva, 7516 Dobson ave.

8905 Escanaba street, Webster, Crombie & Henderson, 9243 Commercial ave.

90th and Escanaba streets, Webster, Crombie & Henderson, 9243 Commercial ave.

98th and Manistee streets, Webster, Crombie & Henderson, 9243 Commercial ave.

228 Forest ave., Garner & Bahn, 1740 Milwaukee ave.

Forest ave., Montrose, M. Minzesheimer, 512 N. Clark street.

1009 51st street, M. Weber, 477 26th street.

988 Fairfield ave., Harvy & Mose, 665 North ave.

Fullerton ave., E. of Jay street, H. Bauer, 232 E. North ave.

Franklin, near Ashland ave., S. Deitscher, Milwaukee ave., N. of Lawrence ave.

637 Fairfield ave., J. Welsh, 475 S. Halsted street.

42d street and Berkeley ave., G. Fehr, 80 Canalport ave.

169 Frankfort street, Nelson & Cederholm, 87 W. Ohio street.

42d 41st street, T. & J. Innes, 1806 Wabash ave.

15th street, E. of Paulina, Dornbos Bros., 573 W. 18th street.

Greenshaw and Claremont aves., M. G. Brooks, 1111 W. Harrison street.

4314 Goodspeed street, Cotter & Son, 867 31st street.

2954 Haines court, C. Kostlevy, 218 W. 18th street.

279 Huron street, W. Gruschow & Co., 84 Oak street.

149 Hoyne ave., W. J. Rankin, 453 W. Madison street.

6812-6814 Honore street, W. Johnston, 652 65th street.

Holliwell, near Huntington ave., S. Deitscher, Milwaukee ave. N. of Lawrence ave.

Indiana ave., near 58th street, P. Schmidt, 4928 State street.

Irving ave., J. Doyle, Holcomb ave., W. of Hunting ave.

Irving ave., E. of Montrose, J. Doyle, Holcomb ave., W. of Hunting ave.

5531 Jackson ave., J. Emblem, 256 31st street.

5215 Jefferson street, D. F. Shay, 9 N. Desplaines street.

168 Jane street, C. Breyer, 833 Milwaukee ave.

887 Kedzie ave., Harvy & Mose, 665 North ave.

Lee ave., Bayha & Bachman, 124 Clybourn ave.

846 Lincoln ave., J. Schuer, 737 Lincoln ave.

Lester ave. and Robey street, T. Foley, 646 Noble street.

1541 Monroe street, Maypole & Bro., 816 W. Van Buren street.

8525 Mackinaw street, Webster, Crombie & Henderson, 9243 Commercial ave.

43 Moffatt ave., H. Breyer, Jr., 1706 Milwaukee ave.

Milwaukee ave., N. of Irving Pk., J. Doyle, Holcomb ave., W. of Hunting ave.

1074-76 Madison street, A. A. Campbell, 842 W. Madison street.

Milwaukee ave., nr. Ashland ave., S. Deitscher, Milwaukee ave., N. of Lawrence ave.

Menard street and Milwaukee ave., S. Deitscher, Milwaukee ave., N. of Lawrence ave.

Milwaukee ave., S. of Loring street, J. Doyle, Holcomb ave., W. of Hunting ave.

Nineteenth street, nr. Robey, C. Kostlevy, 218 W. Eighteenth street.

90th and Exchange pl., Tully Bros., Houston ave. and 92d street.

92d street and Escanaba, Webster, Crombie & Henderson, 9243 Commercial ave.

183-85 Oakley ave., B. O'Neil, 752 W. Lake street.

257 Orchard street, H. Bauer, 232 E. North ave.

8 Oliver pl., C. Uher, 524 W. Eighteenth street.

146 Pacific ave., M. Minzesheimer, 512 N. Clark street.

140 Potomac ave., Nelson & Cederholm, 87 W. Ohio street.

Pratt street, J. Doyle, Holcomb ave., W. of Hunting ave.

92 Ruble street, W. Rustman, 238 Fourteenth street.

127 Rumsey st., F. Gruschow, 84 Oak street.

Rosalie Ct. and 59th street, J. P. Thompson, 272 55th street.

730-32 Rockwell street, Nelson & Cederholm, 87 W. Ohio street.

92 Ruble street, W. Rustman, 238 14th street.

Robey street, C. Breyer, 833 Milwaukee ave.

432 Root street, A. Miller, 4300 Wentworth ave.

62d and Halsted streets, J. Evans, 4401 Dearborn street.

Sheffield ave. and Roscoe street, H. Bauer, 232 E. North ave.

61st street, and Wentworth ave., Lyon & Lee, 6215 Wentworth ave.

8908 Superior ave., Brunt Bros., 9115 Erie street.

1071 Seminary ave., H. Breyer Jr., 1706 Milwaukee ave.

Seventeenth street, near Halsted, C. Kostlevy, 218 W. Eighteenth street.

703 Seymour ave., Harvy & Mose, 665 W. North ave.

St. Charles ave., J. Doyle, Halcomb ave., W. of Hunting ave.

St. Charles and Douglas aves., S. Deitscher, Milwaukee ave., N. of Lawrence ave.

Seminary and Maud aves., C. Klentz, 352 Elston ave.

226 Sangamon street, Nelson & Cederholm, 87 W. Ohio street.

7136 Shell ave., E. & T. Sanford, 5103 State street.

68th street, near Winter, W. Johnson, 652 65th street.

St. Louis ave. and 27th street, Dornbos Bros., 573 W. Eighteenth street.

74th and Bissell streets, F. J. Fisher, 7446 Cottage Grove ave.

79th street and Bond ave., Webster, Crombie & Henderson, 9243 Commercial ave.

79th street and Storms ave., J. Kotva, 7516 Dobson ave.

74th street and Bissell ave., F. Fisher, 7446 Cottage Grove ave.

1193 21st street, C. Kostlevy, 218 W. Eighteenth street.

Fry ave. near 22d street, C. Kostlevy, 218 W. Eighteenth street.

3127 31st street, E. Hennessey, 3247 State street.

1393 Taylor street, J. Welch, 292 Blue Island ave.

792 Taylor street, M. C. McDonald, 383 Ogden ave.

164 25th Pl., L. Herzog, 2230 Archer ave.

878 35th street, Morris Bros., 3442 S. Halsted street.

375 Taylor street, J. Butler, 521 W. Taylor street.

4431 Tracy ave., A. Miller, 4300 Wentworth ave.

193 Van Buren street, J. Teutsch, 2961 Wentworth ave.

145-47 Van Buren street, J. Breen, 373 W. Van Buren street.

1523 Western ave., Garner & Bahn, 1740 Milwauke ave.

1569 Western ave., Garner & Bahn, 1740 Milwaukee ave.

Wood and Polk streets, J. W. Brown, 364 Lincoln ave.

Wallace Pl. and Eighteenth street, F. Meek, 485 W. Eighteenth street.

Washington street, north of Holcomb, J. Doyle, Holcomb ave west of Hunting ave.

17 Walker street, C. Uher, 524 W. Eighteenth street.

5533 Winter street, Bryson & Son, 6335 Wentworth ave.

5524 Winter street, Bryson & Son 6335 Wentworth ave.

3320 Wood street, Watson & Davidson, 301 Wabash ave.
4026-28 Wabash ave., J. Hardin, 4539 Cottage Grove ave.
Washington street and Centre ave., J. Doyle, Holcomb ave., west of Hunting ave.

FOR THE DIGESTION.

"I've got $10,000; I want to build a house." "You can't do it." "Why not?" "It takes $20,000 to build a house for $10,000."—*Puck.*

"Talking about literary style, there goes a man noted for his finished sentences." "Indeed? Is he a novelist?" "No; he is an ex-convict."—*Baltimore American.*

"The leaves will be dropping soon," he said, with a tinge of sadness in his voice. "Yes," she answered, "they have to be up with the fall styles, you know."—*Washington Star.*

First Little Boy—"And does your sister play the banjo?" Second Little Boy (proudly)—"Indeed she does; you just ought to hear her. She's a graduate of Vassar, she is."—*Good News.*

De Wilkens—"No, Miss Tompkins, I am afraid you won't see much of me, because, you see, I am up to my ears in work." Miss Tompkins—"O, I am sure we can still see a great deal of you, then."—*Life.*

De Tracker—"The killing of that jockey in yesterday's race was a horrible affair, wasn't it?" De Better—"Horrible, horrible. Just made me sick. I had all my money on that horse."—*New York Weekly.*

"You say the chicken soup isn't good? Why, I told the cook how to make it. Perhaps she didn't catch the idea." Boarder—"No; I think it was the chicken she didn't catch."—*Brandon Bucksaw.*

"My friends," sadly remarked the minister as he pocketed the 38-cent collection, "you cannot take your money with you to the other shore. The reason for that is quite plain to me; most of you will be mighty anxious to buy return tickets."—*Indianapolis Journal.*

First Little Boy—"My ma got a new dress yesterday, and she threw her arms around my pa's neck. What does your ma do when she gets a new dress?" Second Little Boy—"She says she'll forgive him, but he musn't stay out late again."—*Cloak Review.*

A good many self-made men evidently got tired before the job was finished.—*Indianapolis Journal.*

Burlesque actresses as usual this season will wear nothing but divorce suits.—*Binghamton Republican.*

Girls who allow sparking in their homes should use smokeless powder so that the engagement may not be discovered.—*Baltimore American.*

Smith—"One of Jones' sons was an idiot. What became of him?" Brown—"He's got a position as a truck driver, and is getting along well."—*Puck.*

Ethel—"After marriage we two shall beone, shan't we, George? George—"Theoretically; though I doubt if they will make out the board bill that way."—*New York Sun.*

Trifles should never be allowed to discourage the ambition. When a kangaroo is on its last legs it may still be able to do some good jumping.—*New Orleans Picayune.*

Mrs. Grimsby—"What shall I do with the old yachting dress? I'll never wear it again." Grimsby—"Why not give it back to the dressmaker? (Sadly) She has the yacht."—*Cloak Review,*

Bunting—"I saw a sight to-day which did my heart good." Larkin—"What was it?" Bunting—"A plumber getting a prescription compounded at a retail drug store."—*Brooklyn Life.*

Mr. Noopop (through the telephone, 2 a. m.)—"Doctor, come down right away and see the baby." Dr. Paresis—"What seems to be the trouble?" Mr. Noopop—"I think it's insomnia."—*Lite.*

A petrified hog has been found near Clarksville, Tenn. It is supposed he was petrified by seeing another hog uncross his legs in a street-car when a well-dressed woman wanted to pass.—*Buffalo Express.*

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Faber & Pagels have designed a 3-story seminary, 100x150, a chapel, five residences, hospital and other buildings for the English Lutheran Society, to be built on the block bounded by Clark street, Sheffield avenue, Addison and Nellie streets; cost, $300,000. Treat & Foltz have planned an 8-story and basement warehouse, 100x75, to be built at the southeast corner of West Washington and Canal streets by J. A. Wollensak. It will be supplied with steam heat; cost, $100,000. The same architects have designed for Mrs. Payne, a 5-story apartment house to be built on State street near Burton place. Stone construction; cost, $15,000. They have also designed a $5,000 addition to Dr. J.B. Mill's residence at 58 Warren avenue. Flanders & Zimmerman have completed plans for a 17-room school building, 3-stories, 97x130, for the Board of Education, to be built on Harrison street near Sacramento avenue: cost, $70,000. They have also designed a 3-story school building, 170x120, to be built at the corner of Deering and 31st streets by the Board of Education; cost, $80,000. The same architects have in preparation plans for a 7-story carriage repository, 80x171, to be built at the southwest corner of Michigan avenue and Harman court by Doggett Bros. It will cost $150,000. Morrison & Foster have designed a 4-story and basement flat building, 100x120, for A. L. Patterson, to be built at the northwest corner of 43d street and Evans avenue; cost, $75,000. The same architects have designed a 2-story frame dwelling, to be built at 63d street and Woodlawn avenue for Mr. Erickson. Wilson & Marble have plans under way for two 3-story dwellings, 24x72, for Edward Mendel, to be built at 3926-3928 Grand boulevard; cost, $36,000. They have also designed for S. Klein a 3-story residence, 25x70, to be built on Ashland boulevard, near Harrison street; cost, $20,000. L. B. Dixon has plans under way for two elegant 3-story and basement residences, 25x80, to be built on Michigan avenue, near 31st street, by D. McCallay. They will be heated by hot water; cost, $30,000. R. C. Berlin has designed a 3-story flat building, 76x66, and a 2-story milk depot and barn, 27x54, for P. Fitzgerald, to be built at 105 Osgood street. It will be warmed by hot water; cost $12,000. He also designed a 3-story and basement flat building, 25x65, for John Schnitzer, to be built on Woodlawn avenue, near 55th street; cost, $10,000. For A. E. Cornish he has designed a 3-story flat building, 22x52, to be erected on Burling street, near Fullerton avenue. It will be of stone; cost, $8,000. For Lawrence Brenan he has planned a 2-story frame dwelling, 21x54, to be built on Dunning street, at a cost of $35,000. He has also designed a 2-story and basement store and office building, 30x110, to be built at La Salle, Ill., by Joseph Brennerman; cost, $9,000. Cass Chapman has designed a 3-story flat building, 125x56, for Duplicy Bros., to be built at 48th street and Langley avenue; cost, $35,000. Perley Hale has designed three 2-story and cellar flat buildings, 66x50, for Neil & Molinke, to be built on Green between 56th and 57th streets; cost, $15,000. J. A. Thain has designed a 3 story and basement frame residence for Julius Loeb, to be built on Everett avenue near 54th street; cost, $12,000. J. C. Brompton has designed a 2-story frame residence for R. Haws, to be built on Robey street. He has also designed a 2-story attic and basement residence, to beat Edgewater; cost, $10,000. E. H. Turnock has designed a 2-story flat building for Frank French, to be built on Wabash avenue near 57th street. The front will be constructed of stone; cost, $7,000.——Cincinnati, O.: George Vogel has plans for a hotel to be erected at Fort Thomas, Newport, Ky., to be four stories, built of frame; cost, $50,000. H. E. Siter has prepared plans for a church, to be built of brick with stone foundation and trimmings; cost, $11,000. Address Rev. A. B. Howard, pastor of the Chapel of the Nativity, Price hill, Cincinnati, O. Baude & Kunz have plans for a church for the Evangelical Protestant Martini Congregation, Sedamsville; cost, $7,000.——Milwaukee, Wis.: George Brunder will remodel four stores; to cost, $5,000. Plans have been prepared for a church for the Congregational Church Society; to cost, $20,000. A 2-story brick and stone "home" is to be erected for the Protestant Home for the Aged Society; to cost $35,000.——Denver, Col.: Kirchner & Kirchner have plans for a city hall at LasVegas, New Mexico, to be two stories with 3-story tower, and cost $30,000.——Atlanta, Ga.: The Manchester Sanitarium Co. has been organized by J. J.

Knott and others to build a sanitarium at Manchester.——Rome, Ga.: Bruce & Morgan, of Atlanta, have prepared plans for a courthouse to be erected here, and J. C. Foster will receive proposals for its erection until Nov. 2.——Mt. Clemens, Mich.: N. J. Gibbs has plans for a hotel to be erected at Sarnia, Ont.; to be 300x50, four stories, built of common, pressed and ornamental brick, stone foundation and trimmings; cost, $150,000. The same architect has plans for a hotel to be erected on Cass avenue, Detroit, Mich., for George Fenton, of Mt. Clemens; to be 50x75, four stories, built of common and ornamental brick, stone foundation and trimmings; cost, $25,000.

HEATING AND LIGHTING.

The following electric light companies have been recently incorporated: Goshen Light & Power Co., Goshen, N. Y.; J. W. Corwin, W. H. Wyker and R. B. Hock; $15,000. West Atlantic Land & Improvement Co., Atlantic City, N. J.; electric light and power; G. H. Perkins, C. L. Maxwell, E. J. Hackney and R. M. Bateman; $100,000. City of Oklohoma Light, Mfg., Canal & Water Power Co., of Jersey City, N. J.; to operate in Oklohoma; W. D. B. Jones and J. H. Bell, Brooklyn, N. Y.; E. B. Newell, New York, and L. L. Clark, Jersey City; $150,000. La Junta Electric Light & Power Co., La Junta, Col.; B. F. Hasking, Frank Finney, and J. B. Sherman; $15,000. Granite Falls Electric Power Co., Snohomish, Wash.; $200,000. Thomson-Houston Electric Light & Power Co., Sharon, Pa.; D. W. Dunn, Allegheny; E. G. Waters and A. W. Williams, Pittsburg; $30,000. Garden City Electric Co., Chicago, Ill.; F. O. Ruloing, E. H. Stephens and J. F. McCraw; $10,000. Field Electric Light Co., Morris, Ill.; Enos Field and Jacob Goriel; $15,000.——Manchester, N. H.: The Lighting Committee will receive proposals for the electric lighting of the streets.——Olyphant, Pa.: The borough has voted to issue bonds for $10,000 for electric lighting.——Chester, S. C.: The National Electric Light Co., of Wisconsin, will put in a plant.——Greenville, O.: The Village Council will receive new bids for electric lighting.

SEWERAGE NOTES.

Newton, Mass.: Sewers have been ordered in a number of streets.——Nantucket, Mass.: Mr. E. N. Bowditch, of Boston, will make plans and surveys for sewers.——Holley, N. Y.: The sewer question is under consideration by the sewer commissioners.——Niagara Falls, N. Y.: A system of sewers will be constructed. Address W. E. Carr, clerk, or W. C. Johnson, engineer.——Tunkhannock, Pa.: A sewerage system is projected.——Punxsutawney, Pa.: Mr. R. H. Faries, of Williamsport, is laying out a combined system of sewerage. About two miles of pipe sewer will be built this fall.——Portsmouth, Va.: The Portsmouth Sewage Co. has been incorporated. R. C. Marshall is president. The company proposes to build sewers and charge property owners for their use.——Hancock, Mich.: A sewerage system, to drain into Portage Lake, is projected.——Plans will be prepared by C. T. Loweth, of St. Paul, Minn.——Woodland, Cal.: Plans for the sewerage system have been prepared by A. R Wilson and T. H. Reed, of Oakland.

WATER WORKS NOTES

Brunswick, Me.: M. M. Tidd, Boston, has been making investigations for a new or additional supply.——Whatcom, Wash.: A majority of 27 has decided in favor of a public system.——Colton, Cal.: It is reported that the town talks of building works. The present works are owned by a company.——Elk Rapids, Mich.: A vote of 100 to 5 has been taken in favor of works.——Princeton, Ky.: Works are again talked of.——Mifflintown, Pa.: The Mifflintown Water Co. has been incorporated; capital stock, $30,000.——Pottsville, Pa.: The company proposes to lay a line of pipe to St. Clair, 12 inches in diameter and about two miles long.——Mechanicsville, N. Y.: In connection with the new works a reservoir on Plumb Creek is proposed. It will be 16,000 ft. from the village, 117 ft. above the river, and will have a capacity of $75,000,000 gallons.——Tama, Ia.: Works estimated to cost $15,000 are projected by the town.——Excelsior, Minn.: The people have voted for works. The supply will be from Lake Minnetonka and will probably be pumped to a reservoir. Estimated cost, $20,000. Address Mayor W. T. Milnor.——Chester, N. Y.: A supply from Little Long Pond, about 5 miles from and 249 ft. above the village, is proposed.——Clifton Springs, N. Y.: D. A. Lisk, E. D. Copp and others were recently appointed at a citizens' meeting to act with the village board in ascertaining the cost of works.——Orange City, Fla.: The Orange City Water Works & Irrigation Co. has been incorporated by C. A. Bullen and F. C. Rowel, Eau Claire, Wis. Water will be furnished for irrigating orange groves within two miles from the center of the city. It is expected that construction will be started Oct. 15 and completed March 1 next.——Lafayette, La.: A water works election is talked of.——Portsmouth, N. H.: L. S. Scruton is making surveys for a high service supply, to be gathered from springs and pumped. Probably construction will not be started before spring. Meanwhile, a second driven well is proposed.——West Lebanon, N. H.: A fire district and works are projected.——Bradford, Vt.: Joel Foster, Montpelier, has been investigating works here, as engineer.——North Troy, Vt.: The act enabling the village to issue bonds for works has been accepted and J. W. Currier, G. A. Livingston and three others have been elected commissioners.——Danville, Ind.: J. B. Homon is chairman of a committee on proposed works, appointed by the Council.——Brandon, Man.: Bonds for water works and sewers have been voted.——Patterson, Pa.: The Patterson Water Co. has been incorporated; capital stock $10,000.

BIDS AND CONTRACTS.

Winnipeg, Man.: Bids for the construction of the Assiniboine water power works are wanted until October 30. Address the Mayor.——Fort Leavenworth, Kan: Proposals are wanted until October 8, for the construction of a stone building for a garrison mess hall. Address F. H. Hathaway, Captain and Assistant Quartermaster, U. S. A., as above.——New York City: Proposals are wanted until October 9, for furnishing materials and work in the erection of an armory building on the easterly side of Fourth avenue, extending from Thirty-third to Thirty-fourth street, this city. Address the Secretary of the Armory Board, Staats Zeitung Building, Tryon Row, as above.——New York City: Proposals are wanted until October 9, for furnishing materials and works for additions, alterations and repairs to the armory buildings for the Eighth, Twelfth and Twenty-second Regiments, N. G. S. N. Y., this city. Address the Secretary of the Armory Board, Staats-Zeitung Building, Tryon Row, as above.——Brooklyn, O.: Proposals are wanted until October 6, for the construction of certain pavements and sewers. Address C. N. Collins, City Clerk, as above.——Eagle Pass, Tex: The city council will receive bids until October 20, for a complete system of water-works, with a capacity of one million gallons a day. Information will be furnished by Cheney R. Prouty, Mayor of the city.——Tulia, Tex.: The Commissioners' Court, of Swisher County, want bids until October 5, for a brick and stone court house, 60x90 feet. Plans and specifications can be seen at the office of the County Clerk, or at office of W. C. Dodson, Architect, Waco, Tex.——Flushing, L. I: Proposals are wanted until October 6, for the construction of a masonry waste weir and culverts, at the impounding reservoir. Address G. A. Roullier, Superintendent, as above.—Columbus, O.: Proposals are wanted until October 14, for the erecting of a building for a Geological Museum for the Ohio State University, in accordance with the plans and specifications on file in the Auditor of State's office, and also to be seen at the office of J. W. Yost, architect, in this city.——Eagle Pass, Tex.: Bids will be received until October 20, for material and labor for works, as follows: Two 5,000,000-gallons Worthington pumps, two 50-HP. steel boilers, feed pump, 16x100-feet stand-pipe, about 5 miles 10 to 2½-inch cast-iron pipe and 25 Ludlow hydrants. C. R. Prouty is Mayor.——Fort Worth, Tex.: Bids will be received until October 19, for the following material and accompanying labor: Two 8,000,000-gallon pumps, 4 boilers, brick chimney, stone pumping station, 12 8-inch artesian wells, 1,000 feet deep, or 8,000,000 gallons flow daily, stone intake well, timber suction crib, 20x130 feet steel stand-pipe, about 9,100 tons 48 to 4-inch cast-iron pipe, with specials, 208 ton pig iron lead, 15 tons hemp, 488 three-way hydrants, 650 36 to 4-inch double gate valves and boxes, trenching, laying, etc., for about 48 miles of pipe, setting hydrants and valves, and constructing 55,000,000-gallon reservoir, in excavation. Separate bid must be made for the reservoir. J. P. Smith is Mayor, and A. Scoble, Superintendent.——Yonkers, N. Y.: Proposals are asked until October 5, for a steel stand-pipe on Nodine Hill. R. Eickemeyer is President and J. A. Lockwood, Clerk of the Water Commissioners.

BUILDING PERMITS.

Heaton Crosley, 5 3-sty and bst brk strs and flts, 132x60, 218-28 Fullerton ave.; a, A. D. Lepointe	$25,000
John Ritchie, 3-sty and bst brk flts, 25x68, 446 Seminary ave; a, Holabird & Roche	8,500
Sam Brown 2 3-sty and bst brk flts, 42x62, 2720-22 Commercial ave	9,000
Henry Amman, 2-sty and bst brk flts, 22x76, 1742 Wrightwood ave	6,000
N. A. Ferguson, 2-sty brk wrhse, 50x30, 554-56 25th st	7,500
C. H. Severin, 2-sty and bst brk flts, 23x70, 65 Alice st	6,000
A. W. Nelson, 3-sty and bst brk flts, 22x88, 31 Humboldt ave.; a, Osling Bros	6,000
Louis Martens, 4 3-sty brk sts and flts, 74x55, 1367-73 Van Buren st; a, Louis Martens	20,000
Consumers Gas Co., 2-sty and bst brk brn, 60x 60, 548-52 25th street	7,000
Jas. M. Orno, 2-sty and bst brk brn, 50x55, 2408 S. Park ave	10,000
D. M. Hamline, 5 and 1 sty and bst brk fcty and eng. hse, 59x76, 74-80 Moffatt st; a, S. V. Shipman	19,000
Walter F. Knoll, 2-3 and 2-sty and bst brk dwlgs, 47x69, 718-20 Washington bld	20,000
Chas. Martems, 2 2-sty and bst brk str and flts, 42x49, 418-20 Douglas ave	5,500
Peter Peck, 4 sty and bst brk flts, 21x67, 383 W. Fourteenth st	6,000
B. F. Boyer, 3-sty brk str and flts, 30x65, 1336 Madison st; a, E. A. Blondin	7,200
Thomas Nicholson, 2 3-sty and bst brk dwlgs, 30x57, 164-66, 34th st	10,000
Sinai Temple, 1-sty and bst brk addn, 90x50, 2100-08 Indiana ave; a, Adler & Sullivan	20,000
Mr. Wachsmuth, 3 3-sty and bst brk flts, 75x61, 3813-17 Stanton av; a, Thomas & Rapp	15,000
Chas. Breyer, 3-sty and bst brk flts, 23x68, 444 W. Division st	6,000
D. W. Bosley & Son, 3-sty and bst brk dwlg, 22x33, 540 Washington bd; a, S. V. Shipman	8,000
Mrs. Ann W. Payne, 4-sty and bst brk flts, 36x 48, 38 Walton pl; a, Treat & Foltz	15,000
Heath & Milligan Mfg. Co., 4-sty and bst brk fcty, 200x100, 90-104 Seward st; a, W. W. Boyington	45,000
Ernst Maedelen, 3-sty and bst brk flts, 22x70, 1049 N. Halsted st; a, Jno. Schnur	5,000
Mrs. Mary Kulzelka, 3-sty and bst brk flts, 21x 62, 6 Wallack pl	6,000
H. M. Wilcox, 3-sty and bst brk dwlg, 21x74, 3848 Lake ave	12,000
Murth Bros., 3-sty aud bst brk flts, 23x58, 652 W. Erie st,	7,800
Herely Bros., 1-sty brk wrhse, 211x217 428-44 N. Halsted st	8,000
Peter Mies, 2 3-sty and bst brk strs, flts and hall, 51x84, 946-48 Armitage ave	21,500
Winslow Bros., 4 addnl stys, 88x44, 368-76 Carroll ave	12,000
J. H. Merker, 2-sty and bst brk flts, 22x67, 5248 School st	5,000
L. Merki, 3 and 2-sty and bst brk dwlg and brn 30x54, 55th and Dearborn sts	10,000
A. Bochofen, 3-sty and bst brk str and flts, 24x 88, 6201 Halsted st	11,000
P. W. George, 2 2-sty and cel fr dwlgs, 39x42, 7008-10 Stewart ave	6,000
E. Brown, 6 2-sty and bst brk flts, 22x45, 5625-37 Morgan st	20,000
Jno. Switzer, 3 sty and bst brk flts, 25x65, 5480 Woodlawn ave	10,000
Mrs, M. A. Aird, 3 sty and bst brk flts, 23x64, 449 41st st; a, Percy Hale	6,500

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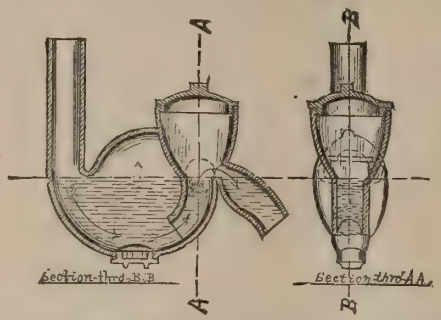

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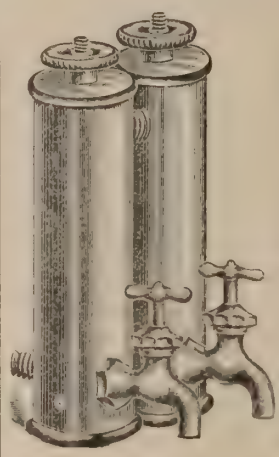

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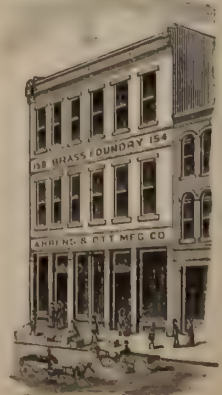

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THERE are a great many things plumbers can do to aid the National Association by themselves. One thing at least seems ready at their hands, and that is local association. In accordance with the constitution and by-laws of that association, they can become affiliated with the National Association, and without the work of any national officers at all. Local associations is one part of the work which is looked to as being a great service to the National Association, and where men link themselves together for beneficial purposes in a location, it will be but another step, and one that will contribute much to their local association, to become affiliated with the larger body, the National Association.

* * *

THE Columbus *Dispatch* says that the river just now is a menace to the health of the city, and just what to do is what the Health Officer does not know. The water is of inky blackness, and from it ascends a most sickening odor that fills the air for squares away. Aid was sought from the Board of Public Works in the matter and also for the Peters Run sewer, but they were powerless. The Health Officer fears an epidemic of fever may follow. The completion of the intercepting sewer will do away with this nuisance.

Here is a fallacy again in the matter of drinking water in which sewage has been allowed. It is not a question of how much sewage is in the water, but, is there any sewage matter allowed to get into it? Report after report should satisfy the people that the fact of sewage entering the water which is to be drunk, is enough to condemn it. There is room for fear that an epidemic of fever will follow. There is every opportunity for it, and if it does not, we would like to have the fact to record it.

* * *

THE hostility we occasionally hear of against plumbers from some one of the dear public is nothing but an indication that some one has gone wrong. From his early bring-up he has had a wrong idea in his head about plumbers. He wants rest and enjoyment in some balmy place where he can feel the cool breezes blow about his feverish head. He will be all right there.

* * *

Is there any reason why any capable plumber cannot join the National Association of Master Plumbers? That is a good thing to belong to, and all that any plumber has to-day has been procured by that association. Do not be afraid and hesitate, but make up your minds to belong to it and the thing is done. You must make up your minds to join it, and join it. So long as you parley and hesitate so long will you not receive all of its benefits and so long will you remain outside of it. There is yet a large number of plumbers who should be identified with it, and we trust this year will find them in full accord with its every movement and full-fledged members of the same.

FILTH AND FEVER.

This may seem to many rather far-fetched, but the study of it will convince any fair-minded person that filth will produce it, or so greatly contribute toward this end, that we might say it does produce it. Some of our Southern cities, where climatic influences have a tendency to make filth the most offensive, there have been cases too clear for dispute where cleanliness has put a stop to the fearful diseases which have been in the habit of visiting them. In some of our Northern cities, where such diseases were not known, filth gave rise to others nearly as bad. We find in the Philadelphia *Record* the following about sewerage:

Concurrently with low water in the streams which furnish the supply in many cities of the country there has been an increase in the number of typhoid fever cases. By so much as the volume of running water is at any time diminished the proportionate pollution is increased. It is fair to infer from more pollution, more fever; and it is reasonable to insist that the way to prevent disease is to stop the cause of it. It is not an impracticable thing to take care of the sewage with which our streams are poisoned. The city of Berlin, with a third more inhabitants than Philadelphia, manages to dispose of its sewage by a system of irrigation which measurably repays the city for the expense incurred. It is also possible to adopt the system of chemical precipitation, which renders the sewage innocuous by admixing it with lime, copperas, sulphate of alumina, salts of iron or other disinfecting and deodorizing substances. The city of London takes care of a large part of its sewage by means of chemical precipitation.

The strong inclination shown by the people of the United States to huddle together in towns makes it more imperative that they should take all possible precaution against the dangers inseparable from gregarious living. The only way to get rid of filth diseases is, first, to get rid of the filth. To this end the prevention of pollution in the streams which are now made to serve the double purpose of main sewers for great areas of populated country and as sources of water supply for the larger cities should have the careful attention of capable sanitarians and scientists, to be followed by necessary state and municipal legislation. The longer definite action shall be delayed the more costly and difficult will the solution of the problem become.

Another thing should be looked to: We are pouring too much sewerage in our streams. We are not using them in the manner they were to be used. We are defiling and polluting them beyond all necessity and beyond all hope. If we continue we will soon be drinking water so polluted that diseases of a character heretofore unknown will appear, and the yellow fever of the South will be a mild disease compared with them. There are means of disposing with sewerage without emptying it into our streams or sources of water supply. Water courses is not the proper places for sewerage. The water they contain is made to drink and refreshen vegetation. For this, in their former state of purity, they did all that and gave to the world about them the freshness and beauty of nature unsoiled by man.

We cannot trample upon the provisions made for us and not receive some punishment for it. When we disobey nature we must suffer for it. The filth diseases which are now making epidemics in some of our cities, are the result of thus offending nature by the violation of some of her laws. If it be pouring our sewage into her streams, that is sufficient to call forth her greatest displeasure, and we have not yet reached her full displeasure unless we provide some other source for our sewage. There is no use in depending on our streams, which we must accept as our water supply. If they were the only way out of this affair, there might be some excuse for it. But when it is shown that this disposal is killing our people by the thousands, we think it is time to try some other means.

NEWS AND NOTES.

A Limoges firm has introduced a new problem of firing porcelain by means of a very pure heat without smoke or fumes.

Seven out of every eight loaves of bread eaten in London are made from foreign wheat.

Of seventy-seven German chambers of commerce, forty-five have voted in favor of a national, and sixteen in favor of an international, exhibition in Berlin, in 1895.

There are now 1,700 men and three steam navvies employed upon the works of the Corinth Canal. The extraction effected since the resumption of the works is returned at 1,042,531 cubic metres—*Engineering*, London.

In Southern Arizona there grows a plant from which rope and twine that will almost never wear out can be made. It is the mescal plant. But very little of this rope has been made thus far.

In the year 1200, chimneys were scarcely known in England. Only one was allowed in a religious house, one in a manor house, and one in the great hall of a castle or lord's house; but in other houses the smoke found its way out as it could.

For bedroom papers less expensive ones can be used than for halls, parlors, and drawing-rooms. One very dainty, pretty pattern has a delicate gray ground on which runs a pattern of wild flowers in "baby" blue. A narrow frieze of "baby" blue is at top and bottom, and a delicate ceiling pattern in "baby" blue and gray makes a charming little chamber and is inexpensive.—*Ex.*

Of the entire human race, 500,000,000 are well-clothed, that is, they wear garments of some kind; 250,000,000 habitually go naked, and 700,000,000 only cover parts of the body; 500,000,000 live in houses, 700,000,000 in huts and caves, and 200,000,000 virtually have no shelter.

A deposit of what is known as "fossil flour" has been recently discovered in Maine which will resist the action of acids, alkalies and oils, and is a remarkable non-conducter of heat. It will be used in the manufacture of rubber goods. It contains 95 per cent of pure silica, and when mined comes out as a fine powder.

According to the *Boston Journal of Commerce*, the waste of a paper and pulp mill near West Troy, N. Y., is being utilized as the basis of a new fuel. The waste as it comes from the mills is nearly pure carbon, and by cleansing and chemical treatment it is converted into a form that permits of nearly perfect combustion. It is said to burn rapidly, with intense heat, and with few of the unpleasant features attendant upon the use of bituminous coal.

REPORT OF COMMITTEE ON CHANGES IN PERMIT DEPARTMENT OF WATER OFFICE.

Chicago, Sept. 24, 1891.

To the Chicago Master Plumbers' Association.

Officers and Brothers: We, your special committee on changes in permit department of Water Office of the city of Chicago, beg leave to submit our report as follows: We had several preliminary meetings, the proceedings of which were not of sufficient note to make report of same, but our consultation gave us the required information of the different evils and injustices we were being subjected to in the procuring of our water permits. We drew up a report to the Commissioner of Public Works, describing each and every wrong as existed in aforesaid department (a copy of which is herewith attached). Our worthy chairman called on Commissioner Aldrich and presented him with a copy of our grievance for him to dissect at his leisure and be prepared to meet said committee at as early a date as possible. A short time afterward your committee met by appointment with the Commissioner of Public Works, Superintendent of Water Office and the Superintendent of Streets, to whom your committee explained in detail the different wrongs we were subjected to as embodied in our report, to which they gave their utmost attention and gave us assurances that they would concede to us all of our demands if practical.

We next met with the superintendent of Water Office and Mr. Napier, permit clerk, to agree upon the different changes they thought they could make for our benefit.

First. Back water tax. This we will have nothing more to do with, the water office thinking themselves capable of looking after this without our assistance. Hereafter you will not have to run over to the division clerk to see if all water taxes are paid on property for which you want your permit.

Second. Street permits. We could not get the change in the manner of securing our street permits that we applied for, as it would interfere too much with the workings of the department, being a separate department from the Water Office, but we got a concession, namely: We secure our street permits first, for the day we want to open same, and if we find, when we get our water permit, that we cannot open street same day as permit calls for, we need not go back to street department to notify them when the tap can be put in, as the street department will secure that information at the close of each day.

Third. Builders' taxes. We need not look up and see if same are paid, but building permits must be taken out before we can get our permit. We could not get that stricken out.

Fourth. Permits for moving buildings will be confined to another window, so that we will not be delayed any more from this source.

Fifth. Water meters will be the same as heretofore. This has been a great source of delay as permits for same are few compared with taps.

Sixth. Cashiers. We will have a separate window labelled "Plumbers' Window" for the payment of our money in the busy seasons of collections of water taxes.

Seventh. Flat books are supposed to be for this department and always to remain in a proper place arranged for them in said department, and when taken for use to any other part of the building and not immediately returned, will be considered a misdemeanor and subject to expulsion; a properly labelled rack will be arranged for said books and indexed so as to show where book is that has been taken from same. New books for newly annexed districts are being made as fast as practicable.

Eighth. Change in form of permits. Permit Clerk will furnish each applicant with form for application for permit (as herein

attached) to be filled out by plumber giving proper description and what is required.

CHICAGO,.....1891.

PERMIT CLERK, Permit No.....Div.....Plat.....
Water Department. Page.....Street Permit No.....

DEAR SIR:

Find below data from which make out for me a Water Permit for.....inch pipe to connect with.....inch tap on..... inch main on.....side of.....Street or Avenue..... ft.....of.....Street for.....ft. of Sub-lot..... of Lot.....Block.....Addition or Sub-division. Section.....', Size of building.....x....., No. Water Closets....., Bath Rooms....., Wash Basins....., Street Washers.....Miscellaneous not noted..... ..... Per.....

Owner or Agent. Plumber.

Correct.....
Permit Clerk.

If you cannot get a legal description, mark proper location on back of application paper, giving the street on which tap is to be put in, also between what streets and number of feet from nearest cross street, which can be left with permit clerk and called for at any other time, save waiting for same to be filled out. Also permit clerk will put the amount to be paid on permit first which you can take to cashier and pay same while he is filling out the stub. This is a concession we got, but not what we wanted. We wanted the application to have the amount to be paid on, so that the permit clerk could certify to its being correct, and we could then take same to cashier and pay same and return it to the permit clerk to do whatever copying or forming of permits which he liked, so long as we would not have to wait for him. But taking it all in all we have made some improvements which will modify our delays some, and trust that in some future time that we will be able to have a sufficient modification of a permit (necessary for us to introduce water into the different buildings at which we happen to be so successful as to have the contract), as to cause the least possible delay in securing same.

Remaining yours fraternally,

F. C. BOYD, Chairman, T. C. CULLOTON, Sec.,
M. L. MANDABLE, J. H. ROACH,
ANDREW YOUNG, THOS. CONLIN.

Committee on Changes in Permit Department of Water Office.

CHANGES ASKED FOR IN THE PERMIT DEPARTMENT.

CHICAGO, July 28, 1891.

To the Commissioner of Board of Public Works of the City of Chicago:

We, the Master Plumbers of Chicago, wish to have a few changes made in the form and manner of securing the necessary permits for the performance of our work, as the present method works a great deal of unnecessary hardship in the loss of time in looking after a great deal that really does not pertain to our business, to wit: Back water tax must be paid before we can secure our permit. What ought we to have to do with this? If there is any water tax to be paid we must notify the owner and have him pay it before we can proceed with our work. This alone works a great hardship on us. We have a contract to do certain work, we go to get our permit, back water taxes are due on the property, we cannot get a permit, our work stands unfinished, we run around to find the owner or the authorized person to pay such, we cannot find him for several days, the probabilities are our men are at work on the job and waiting for this to be settled. In a number of cases we pay the back water tax so as not to be delayed, trusting that the owner will remit same; but in a number of cases he will not pay us, saying he did not authorize us to pay his bills, and the consequences are we are out that much. Now the Water Tax Department is able to cope with this back water tax without our assistance. They have recourse to shut off the supply until it is paid, but it should not interfere in any way with our permits. Now the manner of securing our street permits is unbusiness like; we have to go to another department for them. They could be issued in the same department we secure our water permits from, and on the same form. A set price or deposit could be made for each of the different kinds of pavements necessary to be torn up for opening streets and a return made to the street department each day.

Another injustice to us in applying for a permit: If no building permit is taken out, we cannot get our water permit. It is not right for us to be the watch-dog of all the departments, when there are employes of these departments to look after this business. Permits for moving buildings should not be in this department but in all the building departments, as sometimes we have to wait a long while for those getting permits to move houses, to be waited upon. Water meters could be furnished us from this department by paying for same, which could be reported to Water Department at the close of each day. A cashier should be in this department as the revenues are ample to afford the additional services of an assistant from the Treasurer to this department. In the season when water taxes are payable it takes us considerable time to pay for our taps. Another source of delay is the inadequate supply of plat books, a complete set of which should be for this department alone. As it is now the books are used all over the water office, and sometimes when we want a book it must be looked for and the chances are a delay before it is got.

The forms for drawing up a permit are too lengthy, and unnecessary time is wasted in filling them out. There should be an application furnished us for our permit to be presented when one is desired with proper blanks to fill out as follows:

WATER PERMIT.

.....
.....inch connection with water main on.....
side of..... .....St. No .....between .....
Sts. Sub-lot.....Lot.....Block.....
.....Addition to Chicago.
Owner .....
Plumber .....
Amount paid,.....$ .....
Street permit No.....
Deposit.....$ .....
Notified for .....

As we are representative business men of Chicago, engaged in a vocation of no small importance, there should be some recognizance to our requests, for, unless the advanced ideas gained from practical knowledge and continued experience of the different business interests of our city, are recognized and efforts made by the officials to whom we entrust them to faithfully promulgate these ideas so as to have them produced in the best forms whereby they will be for the greatest interests of the business of Chicago, then the business interests cannot keep pace with the rapid advancement of civilization. To whom could city officials look for the best modes of carrying on the different departments than those with years of experience in the business which they most directly come in contact with? We voice the sentiments of every business plumber in Chicago, whom I dare say to a unit will tell you that the modes of procedure, as at present in force in the permit department of the Water Office, are wrong, and heaps too much of an injustice on those who, unfortunately, must apply there for permits to carry on their work. Therefore we hope and trust you will give this matter your most earnest attention and retain the good will of the Master Plumbers of Chicago. Most respectfully yours,

F. C. BOYD, M. L. MANDABLE,
ANDREW YOUNG, T. C. CULLOTON,
J. L. ROACH.

A TRIP FROM CHICAGO TO ST. LOUIS.

BY DENT YATES, SANITARY PILGRIM OF KANSAS CITY.

This is a St. Louis letter but the first act opens in Chicago. It would never do to leave Chicago without visiting the Kelly Bros., 75 Jackson street. These boys are an example of what can be done by master plumbers when they have brains to get out an invention and grit to develop it. The first thing the boys invented was a greatly improved stop and waste cock. This sold like wildfire. Then they began making water closets with an air cushion in place of a tank. These were also a howling success. Now they have a new closet they call the Silent Wonder, and an improved valve and several other things. There are three of the boys; the day I called they were busy sending out postal cards to their old

customers, stating they had quit plumbing and would devote their entire time to manufacturing; and they take trips to the Adirondacks in the summer, yea, and likewise to Dublin, Ireland, and Kokomo, Ind. Such is the reward of the successful inventors. Go thou and do likewise. After shaking hands with this grand aggregation of talent I purchased me a railroad ticket also a permit from that great prince of chargers, Baron Pullman. I covered myself up with one of his hair-felt blankets, laid my throbbing temples on one of his mineral wool pillows, and so when morning dawned I was in St. Louis.

The first impression one gets of St. Louis is the fact that it is an old town and that the people are in no particular rush. So they are not, but they get there, nevertheless. But if a plumber is once settled here a matter of twenty years or so (you are considered a carpet bagger up to that length of time, so I am told), he can make a good living and something more.

The first plumber I called to see was W. H. Graham of the firm of Graham & Peters. I did not find him in his office. I was told by his partner, Mr. Peters, he was out hustling the men down at Vandeventer place where he has three or four residences. This is the firm that did the plumbing of the Cupples residence, which caused Cupples to loosen up twenty thousand dollars or so, and thereby get one of the finest jobs of plumbing in the United States. They are also doing a very large residence south side of Locust between Leffingwell avenue and Vermont. Peters stays inside, looks after the finances, and keep things in shape in the way of stock and collections. He has gray whiskers, a commanding stage-presence and might be mistaken for a banker. Graham is a plumber, orator and inventor, and he is a dazzling success in either one of these lines. Graham looks after the outside work and by his persuasive eloquence and good reputation nabs the before mentioned jobs and many others. He secures most of them on percentage or day work and does them right. He formerly wore silver-colored whiskers which were a dead match for his partners, but has had them cut off lately as he was the outside man and had to travel faster this busy season.

Fred Abel, of the firm of Abel & Co., is another representative plumber. He is a heavy set man with a little goatee to keep his mustache from being lonesome. Fred lives in one of the finest residences of any plumber in the country. He is doing lots of good work in different parts of town; employs a large force of men and his wagon may be seen on the streets almost any time rushing frantically to different points, slapping down plumbers' goods and gathering up ducats therefor. Thomas Cantwell, on Olive street, between Tenth and Eleventh, is another old-time St. Louis plumber. Cantwell is also a short, heavy-set, solid looking, cheery looking man. He is also doing an extensive plumbing business, which, at the present time, consists mostly of first-class residences in different parts of the city. Cantwell does considerable hot water heating, also, and sooner than have any trouble with an old customer he will fit up his store building with steam or hot fog, as the case may require.

Eugene Tumulty is a good man, weighing 250 pounds; his shop is located on Chestnut street, but he is a long way from being a chestnut himself. Eugene is an A 1 plumber and does an excellent overhauling and jobbing business, besides plenty of new work.

The firm of Dooley & Lancaster have not been in business as long as some of the boys, but they are decidedly in the front rank at present. Sam Dooley has just built himself a fine residence in one of the pleasantest parts of St. Louis. Sam is a hustler and no mistake. Mr. Lancaster was formerly city tapper. He is well off, owns several houses, and accumulating that kind of stuff that builds more. Amongst other jobs this firm are doing two private residences on Vandeventer place, four on Morgan street, five on the north side of Paige; besides a big saloon job under the St. James Hotel, where they are shoving in fine marble and nickel plated pipes and sanitary fixtures galore.

Wm. J. Hill is a good looker and one of the best dressers of the craft. Willie is a good judge of base ball also and may be seen on the grand stand howling like a confirmed fan.; but this don't happen often as Willie is too busy a man. He also owns a nice residence. He is doing some very neat jobs on Clifton Heights, at Kirkwood and different parts of the city, in which he is using wash tubs full of solder and loads of goods.

Volumes could be written of the many achievements of David B. Collins as a plumber, a sergeant-at-arms, orator, etc., but in the brief limits of a letter we can only say that David is doing a good business and has sent his son to the New York trade school, both of which are good things to do. There are lots of other splendid boys in our craft in St. Louis, but I think I did pretty well to pump out this much information in one day and attend to other business too.

The Supervisor of Plumbing, Thomas Hennessey, is both an efficient inspector and a popular man. He is no coward either, as some would-be bluffers can testify. Tom is a genial fellow and can hold up his end in a banquet or any occasion of that sort. Tom has a horse that passes everything on the road. He uses pot pieces for toe weights, otherwise there is no telling where the horse would throw his feet. Tom has a force of nine men all busy inspecting plumbing.

I stopped in at the N. O. Nelson Mfg. Co. This is one of the largest houses in the United States in our line as well as the steam heating and other lines. N. O. Nelson, who presides over the destinies of this big concern, is a tall, well built man, and is as busy as a beaver. He seems to be able to think of a good many things at once, and in the brief time I was with him transacted more business and was more entertaining with me at the same time than any one I have met. Nelson has helped to educate some of the brightest men in the plumbing supply line in the country; for instance, Cahill & Collins, one or both, and that great salesman Wilson, of the Western Brass Manufacturing Co., of whom more anon. I saw Nelson's grand vizier, Vosburg, sitting in state at his desk and looking after Nelson's interest as faithfully and efficiently as he does when he goes on the road. Vos is undoubtedly one of the best all around men in the plumbing supply business. When Nelson's business is making some special progress Vos smiles like the full moon. If some plumber happens to fail and break it off in Nelson (they don't do it often, though) Vos looks like the cave of gloom and feels a good deal worse over it than Nelson.

I saw Peter White, of the P. White Sanitary Co. Pete is just starting in for himself in the plumbers' specialty manufacturing line. I cannot help but compare Peter to Daniel Doyce in Charles Dickens' Little Dorritt. He has that same pleasant smile and suppleness of thumb that Dickens loved to depict. Peter is starting out without debt and with good trade. Success Pete.

But speaking of success, did you ever see any firm get in the very front rank of plumbers' specialty manufactures like the Western Brass Manufacturing Co., 615 Walnut street, in the time that they did. When this firm started up a very few years ago, certain wiseacres nodded their heads sagely and said another supply house turned out in the market to die. But the plumbers kept buying their goods and Wilson probably traveled more miles, buzzed more architects and sold more goods to plumbers than anybody in their line. They just naturally *had* to do it, but they are wearing good easy shoes now, are prosperous, have made lots of money and just about doubled their capital and business every year. They have fitted up a show room just lately, in order to show their many specialties. Their Mr. Althaus is a splendid inside man and looks after the financial end of the concern. Their assistant city salesman, Alfred Yates, is a relative of mine, but he is not to blame for that. He was twenty-one years old the other day and feels his oats considerable.

Just as I got to the depot who should I meet but Mr. Akin of Peck Bros., of Chicago. Now anybody that has ever met Akin knows the consequences; he laughs till he cries, takes a smile if he smiles, and gives him an order even if he has to take a hammer and break a bowl to do it. Akin can be either the funniest man on earth (I never saw his equal off the stage), or he can have all the dignity of a judge when necessary, and he can everlastingly sell goods. Bye-bye, St. Louis, you are a good town after all.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

The following editorial was received from a recent issue of the Philadelphia *Ledger*:

Chicago appears to be making considerable progress in the effort to abate the smoke nuisance of factories and locomotives. A branch of the Department of Health has charge of this business,

and the report of Andrew Young, Inspector, furnishes some interesting information on the subject. In about nine months under his administration 2,189 notices to abate nuisances were served, in response to which 746 nuisances were abated. There were 485 suits prosecuted. In only one case was there an acquittal, but seven cases were dismissed without costs. In all the other cases the defendants were required to pay the costs, and over 300 were heavily fined. These statistics represent only a part of the good work accomplished, for many manufacturers voluntarily abate the nuisances without notice from the inspector. His report says: "With careful firing in connection with one of the effective smoke devices now in the market there can be no valid excuse for emitting dense smoke." He adds: "Although not as successful with the different railroads operating in the city as with the stationary plants, yet we have made remarkable progress and reduced the volume of smoke emitted from the locomotive engines to a considerable extent, and there is no doubt that if persistently followed up the nuisance created by them can be as successfully abated as has been done on stationary plants."

This Board of Health officer, who sent us the above, requests news of the smoke nuisance and its abatement. We have sent him some and will continue to send him others until he will feel able to make a personal stride in this direction. In the abatement of the smoke nuisance it must be always remembered that something has to be done, something more than has been in the attempt to abate the nuisance. There must be a rigid ordinance adopted, one that cannot be forced about, to mean anything or nothing; but mean just one thing under all circumstances. This is what every city needs who is going to attempt the abatement of the smoke nuisance.

As there have been many questions regarding the law in force here we append the following, hoping it will prove advantageous to all:

Sec. 1650. The emission of dense smoke from the smokestack of any boat or locomotive, or from any chimney anywhere within the city, shall be deemed, and is hereby declared to be a public nuisance; *provided*, that chimneys of buildings used exclusively for private residences shall not be deemed within the provisions of this ordinance.

1651. The owner or owners of any boat or locomotive engine, and the person or persons employed as engineer or otherwise, in the working of the engine or engines in said boat or in operating such locomotive, and the proprietor, lessee or occupant of any building, who shall permit or allow dense smoke to issue or be emitted from the smokestack of any such boat or locomotive, or the chimney of any building within the corporate limits, shall be deemed and held guilty of creating a nuisance, and shall for every such offense be fined in a sum not less than Five Dollars nor more than Fifty Dollars.

1652. It shall be the duty of the Commissioner of Health and the Superintendent of Police, to cause sections 1650 and 1651 of this article to be enforced; and to make complaint against and cause to be prosecuted all persons violating the same.

Now the trouble begins. You will want to get these ordinances enforced. You will want every man who is burning coal or making smoke to regard them. You will have to have a man who will show no partiality whatever, but will enforce the ordinance to the letter. This is no easy task, and the smoke will not be cleared away within days or weeks. It will take months. There are smoke-preventing devices manufactured that will prevent smoke. There is no doubt about that, and, although the smoke producer may feel indisposed to try them, when he has tried and found the virtues they possess, he will not be without them. They save coal because they actually burn more. Perfect combustion is what is needed to prevent smoke, and when this is once fairly secured, the less amount of coal will become necessary to run the same boilers. This is what makes no smoke. It simply burns up the smoke—or that which would have been smoke if it had not been burned. The sky becomes clear, the houses clean, and the atmosphere pure and healthful. It is most surely worth a trial.

There is one thing that must be watched, and that is those who promise to prevent smoke and in a little time they are making as much as ever. They promise to put in a preventor but none is put in; by careful firing the smoke inspectors considers he has, until, when the matter has cooled down a little, his fireman begins his old trick of lumbering on his coal and the smoke boils up and out making the air black. This class must be treated as any class. They must be prosecuted until they find it better in every respect to use smoke preventors. They must be taught to take as much interest in the condition of their work, houses and buildings as others do. When this point is reached the smoke will be prevented on its own accord.

CONVENIENT TO HAVE ABOUT.

To fasten glass letters, figures, etc., on glass (show windows) so that, even when submerged in water for several days, they will not become detached, use an India rubber cement. The best for this purpose consists of one part India rubber, three parts of mastic and fifty parts of chloroform. Let stand for several days at a low temperature to dissolve the cement. It must be applied very rapidly, as it becomes thick very soon.—*Scientific American.*

F. Sang states, tufa sand, which is found as small pellets or granules in the Rhenish provinces, is mixed dry or wet with Portland or other cement, and the concrete formed moulded into any desired shape. A mixture of equal parts is said to be as strong as granite and less than half its weight, but for many purposes a mixture of 1 part of cement to 3 to 5 of tufa sand suffices. Besides being applicable for ordinary building purposes, the patented material is said to be a good non-conducter of heat, and therefore to be fit for forming the roofs of bakers' ovens and similar uses.

A new antiseptric agent called microcidine, which is composed of seventy-five per cent. of naphtholate of sodium, and twenty-five per cent of naphtol and phenyl compounds, has been tried in France. It is a white powder, soluble in three parts of water. The solution, which is cheap, is said to be a very effective antiseptic without being poisonous or caustic, or injurious to the instruments or linen. Its antiseptic properties are inferior to those of corosive sublimate or naphthol, but surpass those of carbolic and boracic acids ten and twenty times respectively. The solution is said to have given excellent results in dressing wounds.

Here is an idea for a small drawing room boudoir: Tint the walls with soft china pink, and tone them down with lace hangings; Nottingham curtain stuff looks exceedingly well, and, as we all know, is not expensive. After taking them on the wall finish the top with a flounce about fifteen or sixteen inches in length. By dividing a curtain you will get the finished edge for the bottom of your flounce. The pink thus covered becomes very delicate, and forms a beautiful background for water-color drawings. The whole room should be kept as delicate as possible with softly-tinted china as a decoration.—*Decorator and Furnisher.*

The eccentricities of the draught in a chimney are often unaccountable on any theory, however ingenious or profound. There is no doubt, however, that the form of the roof has a great deal to do with the behavior of the chimney, and that many gables and valleys running in different directions causes eddies and currents of air which reveal themselves in a shifting and contrary draught. A flat roof, if other roofs are not close by, avoids most of the difficulty; and every departure from the plain flat surface tends to complicate the problem. The remedy, where there is a confusion of roofs, is to increase the height of the chimney, clearing it from these disturbing influences, and at the same time strengthening the draught.

The following process is noted from France for hardening plaster, so that it may be used as flooring, as wood and tile are at present. About six parts of good quality plaster are intimately mixed with one part of freshly-slaked white lime finely sifted. This mixture is then laid down as quickly as possible, care being taken that the trowel is not used on it for too long a time. The floor should then be allowed to become very dry, and afterward be thoroughly saturated with sulphate of iron or zinc—the iron giving the strongest surface, the resistance to breaking being 20 times the strength of ordinary plaster. With sulphate of zinc the floor remains white, but when iron is used it becomes the color of rusted iron; but if linseed oil, boiled with litharge, be applied to the surface, it becomes of a beautiful mahogany color. Especially is this the case if a coat of copal varnish be added.—*Invention.*

Decorators are beginning to make a great deal of use of bamboo for wall decorations. The canes are split lengthwise and

fastened against the wall in such manner as to form panels, or perhaps to divide a plain background into a series of vertical stripes. They can also be used effectively to separate the wall body from the frieze, in place of a picture mold. When a wall is covered with china matting, in some of the recent designs which are so artistic in their patterns, these split bamboo rods are very appropriate as covering for the joints between the breadths. If a very rich effect is wanted the bamboo may be gilded. The canes are imported already split, so that the decorator, in buying them in that way, is spared a very difficult task.

SUBSOIL WATERS IN THEIR SANITARY AND ENGINEERING RELATIONS.

The following paper on the above subject, by Mr. C. N. Rust, Engineer on Sewers, Department of Works, Toronto, was read at the recent meeting of the Medical Health Association of Ontario:

In preparing plans for the drainage of cities and towns, one of the most important matters to be considered is the draining of the subsoil.

Prof. Pettenkoper shows that outbreaks of both enteric fever and cholera are coincident with changes in the water level of the soil. This is especially the case in gravel soil, when well water is used, which has been taken from wells sunk into the gravel soil, and which soil is also polluted with excremental matter. Low water under such conditions, or a rapid rise in the water line after being low, or any great or sudden change in the water level, is sure to be followed by an epidemic of enteric fever.

The effects of a dry subsoil in influencing health were pointed out by Dr. Bowdilch of Mass., in a phamphlet in 1862, wherein he showed that a great number of deaths took place from phthisis when the inhabitants of a district are located upon a retentive geological formation than takes place when they are disposed on a pervious formation.

Dr. Buchanan, of the Medical Department of the Privy Council, in his remarks in reference to the influence of the works of sewerage in England on the public health, and also as to the influence of the geological character of the soil on phthisical diseases, confirm these views. It has been frequently noticed that in towns which have a rapid slope, diseases due to excremental pollution of the water occur only on the lower side of the street, the houses above the source of pollution being healthy. Mr. Baldwin Latham has observed in a number of instances that without the fluctuation in the water level excremental pollution appears imperative in producing epidemic diseases.

In a great number of cities and towns the inverts of brick sewers have been constructed dry to allow the subsoil water to be freely admitted to the sewers. This practice, I think, cannot be too strongly condemned. In my experience in constructing sewers in Toronto, where in a great many cases no special provision has been made for subsoil drainage, the fact of opening the ground for the main sewer, the building of lateral drains at frequent intervals for house drainage, the construction of gullies, manholes, and also water and gas mains with their different house services, has in all cases lowered the subsoil water to the main sewer. The fact of building a subsoil drain in the center of the street, will not, in my opinion, have any effect on the soil at a distance of seventy or eighty feet from the pipe. In a block of land three or four hundred feet square, the subsoil drain, to be really efficient, would require a number of laterals. I have found this the case with pipe sewers covered with concrete, after the lapse of two or three months, when it has been necessary to open the ground for the purpose of constructing private drains, the ground has been found perfectly dry down to the level of the street sewer.

In many cases it is the practice of engineers to lay a line of subsoil pipe immediately above the main sewer; I have carried this out in a few cases, and at different times examined the pipes, but always found them perfectly dry, and in sandy soil charged with water the pipes have become clogged and thus rendered useless. In the case of houses built upon pervious soil it is important to construct a line of subsoil pipes. The inspectors employed by the city of Toronto report that they invariably find the subsoil water lowered to the level of the main sewer within a few weeks after its completion.

The practice in several towns and cities in England is to construct 12-inch pipes with open joints below the sewer. It is no doubt advisable in cases of towns built upon impervious soil to provide a separate system of subsoil drains, but very few cities or towns have done this. I certainly think it is important to keep the ground water several feet below the foundation of houses, but very little attention has been given so far to the subject in practice, except by the drainage through pores of brickwork.

In connecting sewers on the separate system or where the sewerage has to be pumped, treated with chemicals, or on the land, it is of the utmost importance to carry off the subsoil water by a separate system of drain pipes. Neglecting to do this has been no small factor in the partial failure of some towns where their sewage has been treated on the land.

STAINED GLASS INDUSTRY.

The stained glass of many of the cathedrals and churches of the old world, despite their coarse pigments and awkward leading, were gems of beauty in form and color, and they altogether distance a great deal of what is being done in the same field. On the other hand, however, the high grade glass worker of the present time is achieving results that would have been absolutely unattainable in the ancient and medieval times. It is not generally known that an entirely and distinct line of glass-working has sprung up in this country, which is accomplishing the most wonderful results. It combines all that is best in the other schools, and has added improvements of its own by which all the possibilities of colored glass have been exhausted. To such a high state has this artistic taste been developed, that prices are paid for single windows in private houses which would have seemed fabulous ten years ago. Three thousand dollars is considered by no means an extraordinary price for one of these modern creations of the artist. For beauty, realism and coloring, these high-class windows excel anything that has been seen. The life which has been wanting even in the greatest paintings is possible of realization in glass, where light is behind the picture to infuse it with motion, color and feeling The figure that can only be represented in the act of walking in canvas pictures, can be actually made to move when the sunlight plays on it through the crystal of the stained window. One distinct departure made by the American artists from European practice is the discarding of pigments, which they say destroy the possibilities of taking full advantage of the light, and which they consequently use in faces of flesh tints. Some of the modern pictures, consisting of many thousand pieces of glasses, are joined together with such deft skill by clever leading that lines of the designs are presented in as perfect and unbroken a manner as they were in the artist's drawing.—*Glassworker.*

THE POWER OF WILL IN DISEASE.

This is the subject of a recent and somewhat lengthy editorial in the *Medical News.* The editor says: The manure of the soil nourishing these delusions is a truth too often ignored and neglected by scientific medicine. It is the truth of the power of the emotions, of the will—of the spirit, if you please—over the flesh, of life over the beginnings of disease, and even over disease and death itself. Races and nations differ greatly in their power of resisting and overcoming disease, simply by reason of the characteristic attitude of the will and the disposition of the patient toward the physical illness. Just so do all, even brothers, differ in the same way. Thousands are physically sick because mental resolution and spiritual domination are weak and illogical. This is strikingly true in reference to the beginnings of disease. The secret of continuous good heelth does not always consist merely in physical resistance or robustness, but in sharply conquering the subtle beginnings of corporeal abnormity by pure will-power. There are two homologues of this power that illustrate it exactly. Who has not seen whimsicality, crankiness, and oddity by self-indulgence slowly degenerate into monomania, and even into downright insanity? And, again, who can doubt that in the commencement many such persons are perfectly conscious of the abnormal tendency, and are, moreover perfectly capable of not doing the ridiculous or self-forgetful things? They are at first driven by no imperious necessity. It is precisely so when one gives way to immoral courses of life. At first the voice of con-

science is clear; by and by control is lost and the voice is entirely silent. The analogies obtain in the matter of health. The adage, "Resist the beginnings of evil," holds also here. All disease begins subtly, almost insensibly, as chill, lassitude, malaise, etc. Caught at this stage and fought down by a virile volition, that which by self-indulgence would have proceeded to genuine fever and illness may often be resolved in routine normality of health.

PARISIAN ARRANGEMENT FOR VENTILATION.

The Parisians appear to have found a tolerably satisfactory arrrangement for ventilation in the great hall of the new Sorbonne, by M. Nenot. Here, according to a contemporary, a curious plan is employed. Under the whole auditorium, is a mixing chamber, into which fresh air, both hot and cold, is forced, and mixed to the temperature desired. From the mixing chamber many thousands of small holes, guarded by wire gauze or fine netting, open into the auditorium above, through the floor, the fronts of the seats and other places. Besides these, a special conduit leads to the wall encircling the auditorium, opening behind a moulding, close to the wall. Before the hall is opened to admit an audience, a current of pure air, heated to nearly 200 deg. Fahr., is forced into the latter conduit, and ascends over the surface of the wall, quickly raising it to a temperature of 100 deg. or so. Then just before the audience comes in, the hot air is turned off from the wall, and fresh air at about 60 deg. is abundantly introduced through the floor from the mixing chamber below, until the lecture is over. During all this time the wall remains at a temperature considerably higher than that of the air, and, in consequence, there are no downward currents, or cold draughts, near it; but the whole body of air, after respiration, ascends to the ceiling, from which it is removed by powerful exhausts, through openings just equal, in aggregate area, to the inlets.

UTILIZATION OF SEWAGE.

The *Contract Journal* of London, England, states that the Board of Houghton-le-Spring has decided to adopt a system of sewage utilization recommended by Mr. D. Balfour, M. Inst. C. E.

The process consists in first mixing the sewage in large tanks (in duplicate) with alumino-ferric, a cheap chemical which contains 46.7 per cent. of sulphate of alumina, which is suspended in iron baskets or cages immersed in the sewage to admit of the necessary proportions being dissolved to effect precipitation. It does not, like a large number of chemicals, require any machinery, or add any bulk to the sludge, being entirely soluble in water. It exercises a deodorizing effect, and is not liable, being a neutral salt, to refermentation. The clarified sewage is then passed onto 10 acres of loam landlaid out for intermittent filtration, which consists in forming the land into half-acre beds, broad ridged and furrowed, and used in regular rotation, and having special under drainage with ventilation shafts, from which, with regular and systematic management, the effluent will pass in a colorless and inodorous state. As sufficient suitable land could not be obtained, this chemical precipitation process was conjoined with the available limited land for the purpose of chemically precipitating and deodorizing the solid matter as much as possible before applying the sewage to the land. Various succulent crops, including vegetables and osiers, are grown on the ridges, the sewage filling the furrows. The scheme was approved by the Local Government Board, and the contract for carrying it out has been let by the Local Board of Health to Mr. John Carrick, contractor, Durham, under the superintendence of the engineer.

PRESERVING TIMBER.

A new process for preserving timber is mentioned in *Engineering*, which promises to be of great value for various purposes. The process consists merely in saturating the timber with naphthaline, which is substantially a hard wax. The naphthaline is kept melted in a tank at a temperature of 180 degs. to 200 degs. Fahrenheit by means of steam pipes in the tank, and the timber to be preserved is simply soaked in it for a period varying from two to twelve hours, according to the size of the piece. It is said that green timber can be treated with success, the melted naphthaline making its way through the cells, decomposing the albuminoid compounds and displacing sap and water, leaving the timber, on cooling, saturated with a waxy, antiseptic solid. If such a substitution of solid naphthaline for air and sap in the pores really takes place, wood so treated must have singular advantages for finishing work. Not only would the pores need no filling, but mere rubbing with a cloth would give a polish, and apparently the wood might be exposed to dampness indefinitely without fear of swelling or subsequent shrinking. Architects can appreciate the advantages which stock of this kind would offer for flooring boards, for example, and we hope that the process may be thoroughly tried, with a view to the improvement of timber for interior finishing as well as for railway sleepers and other outside work.

ARCHITECTURE.

The fluctuations in popular taste in matters of architecture and decoration are almost as marked as in fashions for clothing, and a house decorated after the style of ten or fifteen years ago is almost as antiquated in appearance as an old-fashioned suit of clothes. This is especially the case with those buildings which have been overloaded with ornament, bearing neither the stamp of originality or the characteristics of any defined school or period.

When, however, a design is conceived and executed in the consistent spirit of a definite school, it may grow out of date, but never old-fashioned in the ridiculous sense of the term. The changing fashions in architecture, however, carrying with them corresponding changes in popular taste in matters of ornament and decoration, and this is as true of hardware and art metal work as of other details of building construction.

The Queen Anne craze is well over, while the fancy for Colonial work is yet strong. For large commercial buildings in our great cities the popularity of Romanesque designs is still growing, under the impetus which it received from the work of Richardson and his followers.—*Trefoil.*

FOR THE DIGESTION.

We tip the scales to learn our weight, and tip the waiter to avoid a wait.—*Binghampton Republican.*

"Mine is a patient wait," remarked the young doctor, as he sat lonely in his office.—*Baltimore American.*

He—"Are we going to have some music?" She—"No. Miss Van Howl is going to sing."—*New York Herald.*

When they say the bride's costume was a dream do they mean to imply it was an illusion?—*Boston Gazette.*

The flowers that bloom in the spring, tra-la, have a good deal to do with the breach-of-promise case in the fall.—*Dallas News.*

Why should officials spend thousands shooting dynamite balloons when any ordinary teamster can draw rein?—*Columbus Post.*

Deacon Smith—"What kind of a collection did we have today?" Parson Brone—"A collection of misers, I should judge."—*Lowell Citizen.*

"Why is it," asked a stranger, "that you Americans are so anxious to discover the north pole?"

"Oh," replied an experienced globe-trotter, "we Americans are great travelers you know, and we want some new place to write our name on."

Undertaker (to American youth who is lighting a cigarette)—That's right. You smoke the cigarettes; we do the rest.—*New York Press.*

Wife—Why is it that dudes wear only one glass, dearest?

Husband—You seem to forget that they have to have one eye to see with.—*Brooklyn Life.*

Aha! I catch you buying a porous plaster, do I? I thought your devotion to fresh-air theories would bring you to this?"

"It ain't the plaster that does me good," answered the crank; it is the ventilation obtained through the holes.—*Indianapolis Journal.*

Wool—"Have you been in the new restaurant where they weigh you when you go in and again when you come out and charge by the pound for the difference?"

Van Pelt—"No; is it a good place?"

His Sister—"Had you heard that Laura Figg's pug has run away?" He—"Well, what of it?" His Sister—"Oh, nothing; only I

thought that if you intend proposing now is your time. A woman's heart is often caught in the rebound, you know."

Wool—"You bet! I went in yesterday, had some Saratoga chips, dry toast and crisp bacon—5 cents! To-day I had corn-beef and cabbage and English plum pudding and went broke!"

Carruthers—"I'd like to make the acquaintance of a hangman."

Waite—"A hangman! What for?"

Carruthers—"I want to meet some one who prefers not to talk shop."—*New York Herald.*

First Tramp—I never failed yet to make money out of anything I tackled.

Second Tramp—You ought to be rich.

First Tramp—But I ain't. You see I never tackled anything. —*Texas Siftings.*

"Ah! It seemed that my remarks were wholly uncalled for," commented the author when his essays came back to him by way of the dead-letter office.—*Indianapolis Journal.*

Winkle—"I wish I could devise some way of hanging up my clothes." Nodd—"I wish I could devise some way of getting them out after I have hung them up."—*Clothier and Furnisher.*

"So you proposed to her. Accepted of course." "Accepted! Why, she treated me like a dog." "Allow me to congratulate you, old fellow. I saw how she treated one the other day, and, by Jove, how I envied that dog!"

Jinks—"How's this? Why are you not willing to subscribe something toward a monument to Columbus, the discoverer of America?"

Winks (suffering from rheumatism. sore throat, catarrh, bronchitis and a touch of the grip)—"Because if he hadn't discovered America I wouldn't have been born in this cursed climate."

Little Boy (in the menagerie)—Say, pa, is that parrot there the wife of the other parrot?

Little Boy's Father (sadly)—Yes, my son. Don't you see how much larger her bill is?—*Clothier and Furnisher.*

PLUMBING NOTES.

Andrew W. Aiken, of this city, last Monday made an assignment of property for the benefit of creditors to Charles H. Hopkins. Aiken has been in the plumbing business on West Lake Street. Assets and liabilities are about $1,500 each.

J. A. Kelly, a well-known plumber of Madison, Wis., about thirty years of age, went last week to Milwaukee to be united in marriage with Miss Hannah Palmer, a young lady of the Cream city. The ceremony occurred at St. Paul's church at 8:30, Rev. Father Hayden officiating.

B. F. Savits, a plumber, while working on the roof of the Exchange Hotel, at Bloomsburg, Pa., fell to the ground, a distance of sixty feet, causing instant death. His neck was broken and skull crushed. He leaves a wife and two children.

The question whether, in the event of a system of sewers being constructed at Vicksburg, Miss., by a private corporation, citizens could be compelled to connect their premises with the mains, has been much discussed of late. The weight of legal authority is in the affirmative, such a regulation being a matter of necessity, and it appears also that such is the invariable requirement in all cities having sewers.

Slaughter of Innocents.—The report of the Health Committee of the Board of Education, says the Wilmington *News* on the sanitary condition of No. 16 school, submitted at the meeting of the board, is rather startling. The committee asserts that defective and poorly-arranged closets have probably caused the death, within a short time, of six children who attended school there. This declaration is an ominous one and the subject demands a prompt investigation upon the part of the Board Health. There is no excuse, in this day of advanced scientific knowledge of the laws of health, for the continuance of death traps in private houses and public institutions. Defective plumbing undoubtedly causes more deaths than the railroads, and it is more dangerous to life than a magazine of gunpowder in the heart of the city would be. There should be a system of sanitary inspection to include all private houses and public buildings. The fact that all new plumbing is now inspected by a competent man is not sufficient. There are too many buildings which are filled with sewer gas, which is insiduous and deadly. Every public school building should be thoroughly inspected and the plumbing overhauled. There are too many lives placed in jeopardy and the health authorities are clearly responsible for what appears to be a slaughter of the innocents. We are glad that the Board of Education has become aroused and it is to be hoped that prompt action upon their part will remove existing nuisances.

PLUMBING IN NEWPORT.

A case of sanitary plumbing can be seen by dropping in a cottage for Miss Caldwell and her sister at Newport, R. I. The work was done by Mr. P. J. Murphy, contractor for the plumbing. Not an inch of lead pipe was used in the house. Every pipe for hot and cold water, wastes, etc., and all traps are of polished brass. These are all exposed, being clamped to walls and ceilings by patent brass hangers, which hold the pipes firmly about two inches from the walls. The many turns necessary in such work, and because of which lead pipe was so long used, were made by carefully bending the pipe. As this is all exposed it can readily be seen that it was, of itself, a work requiring much time and care to make a perfect job. In the attic the pipes and tank are so protected by boxes lined with sheet lead that any break or flaw will not flood or damage the house, these protecting boxes being connected with an outside waste pipe.

The bath tubs, closets and flush tanks are of white crockery cast in one piece and imported for this work, the bath tubs being something out of the ordinary crockery line, as each weighs fully one thousand pounds. All these together with the marble bowls are trimmed with heavy silver plated trimmings. The laundry tubs, sinks and other similar articles used in the servants' quarters are of crockery, with brass fittings, and connected, as in the rest of the house, with brass pipes. The hundred gallon copper boiler, for the hot water circulatory system, gives an idea of how much hot water is expected to be used even in a summer cottage.

The arrangements for ventilating the pipes, traps, etc., and for preventing any contamination of the air of the house, are the best that have been devised, and are expected to work without dependence on anyone's memory, and without suffering from any servant's neglect.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERIAL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Ashland ave. north of Henry street, Geo. Groll, 886 N. Halsted street.

822 Allport ave., F. Meek, 485 W. Eighteenth street.

140 Ashland ave., A. W. Murray, 811 W. Madison street.

560 Ashland ave., O. Heyman, 300 Washburn ave.

1543 Adams street, C. Juergens, 1274 W. Madison street.

6004-12 Aberdeen street, J. Bain, 6338 Justine ave.

Boulevard near Honore street, C. Kostlevy, 218 W. Eighteenth street.

Bond ave. and 87th street, Webster, Crombie & Henderson, 9243 Commercial ave.

154 Baxter street, J. M. Haefin, 876 Sheffield ave.

279 Bowen ave., Homer & Co., 4138 Cottage Grove ave.

Boulevard south of Moore street, C. Kostlevy, 218 W. Eighteenth street.

4514 Champlain ave., B. A. Finn., 136 35th street.

4810 Cook street, C. Kostlevy, 218 W. Eighteenth street.

Commercial ave., south of 90th street, Webster, Crombie & Henderson, 9243 Commercial ave.

Commercial ave. near Leland ave., A. Keeley, 25 E. Washington street.

418 Chicago ave., W. Muller, 387 W. Chicago ave.

261 Chicago ave., W. Muller, 387 W. Chicago ave.

Champlain ave. and 45th street, J. Hardin, 4539 Cottage Grove ave.

1075 California ave., C. Kostlevy, 218 W. Eighteenth street.

4413-15 Ellis ave., Harry Black, 40 E. 43d street.

Escanaba and 91st street, Webster, Crombie & Henderson, 9243 Commercial ave.

8908 Escanaba street, Webster, Crombie & Henderson, 9243 Commercial ave.

Erie ave. south of 89th street, Webster, Crombie & Henderson 9243 Commercial ave.

W. 43d between Thirteenth and Fourteenth streets, C. Kostlevy, 218 W. Eighteenth street.

47th street, M. Stack, 223 Root street.

659 Fletcher street, J. Dewald, 746 Southport ave.

Florence ave. north of Wrightwood ave., J. Scheuer, 737 Lincoln ave.

W. 42d and Fourteenth streets, C. Kostlevy, 218 W. Eighteenth street.

Fremont street near Webster ave., G. A. Fehr, 80 Canalport ave.

1035 George street, J. Bain, 6338 Justine ave.

26 Heine street, Binder, Barrett & Binder, 49 Franklin street.

Hull street and Diversy ave., C. Redieske, 99 Clybourn ave.

932 Hoyne ave., J. Dewald, 746 Southport ave.

3218 Illinois ave., L. Herzog, 2230 Archer ave.

5841 Indiana ave., G. Mertz, 2208 Archer ave.

1400 Jackson street, D. Jack, 882 W. Lake street.

Kedzie ave. and 25th street, C. Kostlevy, 218 W. Eighteenth street.

Lake ave., near 53d street, J. & B. Rourke, 5434 Lake ave.

319 Larrabee street, C. Redieske, 99 Clybourn ave.

Langley ave. and 68th street, D. Walsh, 6758 So. Chicago ave.

Langley ave. and 72d street, D. Walsh, 6758 So. Chicago ave.

Leavitt and Fiftieth streets, C. Kostlevy, 218 W. 18th street.

Manistee and 89th street, Webster, Crombie & Henderson, 9243 Commercial ave.

Mackinaw ave. and 84th street, Webster, Crombie & Henderson, 9243 Commercial ave.

Mackinaw ave., S. of 85th street, Webster, Crombie & Henderson, 9243 Commercial ave.

2129 Madison street, J. Breen, 373 W. Van Buren street.

1942 Milwaukee ave., H. Breyer, Jr., 1706 Milwaukee ave.

415 Madison street, Hugh Watt, 300 Dearborn street.

Murray ave., nr. 89th street, E. Bradley, Vincennes ave., N. of 103d street.

Madison ave. and 51st street, J. M. Collins, 356 37th street.

134 Madison street, Gay & Culloton, 62 N. Clark street.

90th street and Strand, Webster, Crombie & Henderson, 9243 Commercial ave.

7145 Perry ave., D. Dewar & Co., 6312 Wentworth ave.

5742 Princeton ave., M. Stack, 723 Root street.

3222 Portland ave., J. F. Kurz, 3108 State street.

5006 Robey street, C. Kostlevy, 218 W. Eighteenth street.

Richmond street, nr. Division, H. Breyer, Jr., 1706 Milwaukee ave.

Robey street, S. of Fullerton ave., F. W. Page, 665 Armitage ave.

Sawyer street, S. of Thirteenth street, C. Kostlevy, 218 W. Eighteenth street.

Superior ave., S. of 89th street, Webster, Crombie & Henderson, 9243 Commercial ave.

State street, S. of 23d street, J. Breen, 373 W. Van Buren street.

Stewart ave., S. of 70th street, D. Dewar & Co., 6312 Wentworth ave.

109 Stave street, H. Breyer, Jr., 1706 Milwaukee ave.

Schiller & Astor streets, Hugh Watt, 300 Dearborn street.

Sacramento ave. and Congress street, Young & Cavanah, 995 W. Madison street.

60th street and Wentworth ave., Jas. Stewart, 6438 Wentworth ave.

1244-46 21st street, H. Mund, 2 Ambrose street.

1009 20th street, Dornbos Bros., 573 W. Eighteenth street.

Tracy ave. and Grove, E. Bradley, Vincennes ave., N. of 103d street.

37th street and Dashiell, J. M. Collins, 356 37th street.

141-47 Van Buren street, J. Breen, 373 W. Van Buren street.

Werder ave. and California ave., F. Falk, 717 Milwaukee ave.

1525 Wabash ave., J. F. Kurz, 3108 State street.

Wabash ave., nr. 50th street, Nash & Horn, 2216 Wabash ave.

2409-11 Wabash ave., Young & Cavanah, 995 W. Madison st.

522 Winchester ave., P. J. Morrissey, 417 S. May street.

95 Washburne ave., P. J. Morrissey, 417 S. May street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: George Beaumont has completed plans for a 3-story and cellar apartment house for H. M. Clarke, to be erected on Fletcher street, between Evanston avenue and Halsted street; cost, $15,000. For S. Weise he has designed a 3-story residence, 25x68, to be built at 3360 South Park avenue; cost, $18,000. For Jacob Kohn he has designed a 3-story and basement apartment house, to be build at 435-37 Marshfield avenue; cost, $16,000. Louis Martens has designed a 3-story apartment house, to be built at 412 Ashland avenue by Mrs. C. H. Martens; cost, $10,000. For Mrs. Mary A. Coulter he has made plans for a 3-story flat building, to be erected at the southeast corner of Warren avenue and Francisco street; cost, $10,000. For James O'Neil, a 3-story store and flat building, to be built on Taylor street, near Paulina; cost, $7,500. For Benton Holley, at Windsor Park, six frame dwellings; cost, $15,000. For Mrs. A. Reilly, a 2-story flat building, to be built on Monroe street, near Garfield Park; cost, $5,000. For C. W. Underwood, at Riverside, a 2-story frame residence; cost, $5,000. For himself, a block of 4-story store and flat buildings at the northwest corner of Van Buren and Whipple streets; cost, $35,000. Huehl & Schmid have completed plans for a 4-story store and flat building, 71x48, to be erected on Schiller street, west of Clark street, by Lotz & Thompson; cost, $25,000. Thomas M. Wing has completed plans for a 2-story basement and attic residence, 30x55, for George Duncker, to be built at 1541 Diversey avenue; Bedford stone construction, with tile roof. William Griesser reports plans for a 6-story brewery, 150x80, for Frank Stang at Sandusky, O.; cost, $125,000. For Jacob Kuebeler, at the same place, a malting plant and storage elevator; also a 4-story kiln and a 3-story malt house; cost, $50,000. For Falk, Jung & Borchert, at Milwaukee, a brew-house of 500,000 barrels; cost, $100,000. For the Star Brewery of this city a 50,000-barrel storage house, ice machine house and other improvements at a total cost of $100,000. For the Voight Brewing Company of Detroit, a 3-story storage house; cost, $25,000. For M. Gottfried, at 46th street and Drexel boulevard, 2-story stable; cost, $10,000. Clinton J. Warren will plan an 8-story apartment house, 225x149, to be built by himself and A. W. Maltby, at the southeast corner of North Clark street and North avenue. The interior will be finished in hardwood, heated by steam, supplied with gas ranges and lighted by electricity; cost, $350,000. H. P. Harned has designed for H. S. Robbins a 3-story store and flat building, 150x75, to be erected at Jefferson avenue and 56th street; cost, $50,000. The same architect has designed a 4-story factory, 60x100 to be built on the South Side at a cost of $25,000. W. W. Boyington & Co., have prepared plans for a 16-story store and office building, 100x110 to be built at the southeast corner of State and Washington streets, by H. J. Furber and Van H. Higgins. The building will be thoroughly modern and will cost about $700,000. It will be of brick, and construction will not be commenced before next spring. The same architects have planned for the Heath & Milligan Manufacturing Co., a 4-story and basement factory, 100x200, to be built on Seward street, near 18th street. It will be constructed of brick and stone; will be equipped for use as a paint factory; cost, $50,000. Wm. Strippleman has planned a 5-story factory, 40x210 to be erected at Rockwell and 26th streets, by the W. W. Kimball Co., manufacturers of pianos and organs; cost, $27,000. He has also planned a 3-story and basement store and flat building, 25x86, for F. J. Switzer, to be built on West Madison street, opposite Gross terrace; cost, $11,000. Ostling Bros. have completed plans for a 4-story, basement and attic store and flat building, 25x75, to be built at 209 Oak street, by J. A. Modin; cost, $10,000. Also for Olaf Nelson, a 4-story and basement flat building, 27x54, to be built at 291 North Franklin street; cost, $19,000. Also for M. Lundquist, a 3-story and basement stone store and flat building, 24x56, to be built on School street, near Evanston avenue; cost, $9,000. For M. Sjoquist, a 4-story and basement store and flat building, 24x75 to be built at 152 Townsend street; cost, $12,000. A. M. F. Colton & Son have designed for C. V. Condit a 3-story residence, 70x50, to be built at Evanston. Gray granite boulders will be used in the exterior, while the interior will be finely finished and warmed by steam; cost, $30,000. They have also designed a 2-story addition to the Evanston Township High School, 50x100. It will be built of pressed brick; cost, $20,000. Stiles & Stone have planned for George M. Hoord, a 4-story apartment house, 50x80, to be built on 51st street, near Washington avenue. It will be of cut stone, with hardwood interior, and will be heated by steam; cost, $30,-

000. For Dr. W. S. Johnson they have designed a 3-story and cellar residence, 50x68, to be built at the northwest corner of 54th street and Washington avenue. Cut stone exterior, with hardwood interior; cost, $22,000. Also, for Patrick Murphy, a 3-story store and flat building, 25x62, to be built on Lake avenue, near 55th street; cost, $7,000. For C. L. Sackett they have designed a 2-story store, 23x40, to be built at La Grange; cost, $5,000. R. G. Pentecost has planned a 3-story residence, 29x68, for W. L. Tamblyer, to be built on Michigan avenue, near 41st street, Bedford stone construction; cost, $20 000.——Cincinnati, Ohio.: S. Hannaford & Sons have plans for remodeling a building for the Bell Telephone Company, to be used for offices and exchange; cost, $20,000. The same architects have plans for alterations to the residence of Attorney-General J. Hendrick, of Frankfort, Ky.; to be built of pressed brick; cost, $35,000.——Washington, D. C.: Architect Robert Head is making plans for an 8-story and basement office building, to be erected on G. street, near the Patent Office. It will be Romanesque in design, and have a front of Ohio stone to the second story and upper stories of buff brick; cost, $150,000.——Detroit, Mich.: Mortimer L. Smith & Son have prepared plans for Geo. B. Morhaus' residence, to be built on northeast corner Cass avenue and Stimpson place, of pressed brick and slate roof; cost, $12,000. E. A. Walshe & Son have prepared plans of a pressed brick residence for Robt. J. Wilson, to be built on Hancock avenue, between John R. and Woodward avenue; cost, $10,000. Geo. E. Depew is preparing plans for a frame residence for Mr. Ives on corner Trumbull and Putnam avenues; cost, $12,500. Spier & Rohus have prepared plans for a block of 3-story stores for McKellar & McHugh in Windsor, Ont., to be built of brick and stone trimmed; cost, $17,000.——Milwaukee, Wis.: Otto Stract has plans for a power house, saloon and athletic society rooms to be erected on Broadway and Mason street for Captain Fred. Pabst. To be 60x120, 3-story, built of brick granite, stone foundation and trimmings, stucco and terra cotta; cost, $100,000. Kirsch has plans for a school to be erected at Monroe, Wis. To be 52x64, 2-story, built of common brick and stone; cost, $10,000.

HEATING AND LIGHTING.

The following electric light companies have recently been incorporated: Sharon Telephone Co., of Ogdensburg, N. Y.; Geo. O. R. Bell, John Hannan and J. E. Lum; $15,000. Portsmouth Electric Light and Power Co., of Newport News, Va.; E. C. Hillyer, T. H. Gordon and W. W. Archibald; $100,000. Fredonia Electric Light, Heat & Power Co., of Fredonia, N. Y.; Geo. Barker, L. McKinstry and F. R. Green; $30,000. Thomson-Houston Electric Light & Power Co., of Sharon, Pa.; treasurer, Edward G. Waters, Pittsburg, $30,000. Electric Construction Co., of Roanoke, Va.; H. W. Sellers, C, A. Pearson and R. J. Byron, of Philadelphia, Pa.; $300,000. Gray Electric Co., of Chicago, Ill.; electrical supplies; Elisha Gray, F. W. Cushing and L. O. McPherson, $100,000. Pittsburg Underground Electric Construction Co, of Pittsburg, Pa.; C. D. Robbins, D. J. Rex and J. J. Miller; $300,000. Nicholson Electric Hoist Co., of Cleveland, O.; Martyn Bonnell, Ezra Nicholson and E. C. Pope; $30,000. Bogota Water & Light Co., of Bogota, N. J.; A. G. Munn, Robert Dyatt and George Foster; $5,000. Towson, Md.: An electric light company of South Bend, Ind., is investigating relative to the establishment of an electric light plant.——Moberly, Mo.: An electric light plant is to be put in this fall at a cost of $50,000.——Haverhill, Mass.: The street lighting committee is in favor of a municipal electric plant.

SEWERAGE NOTES.

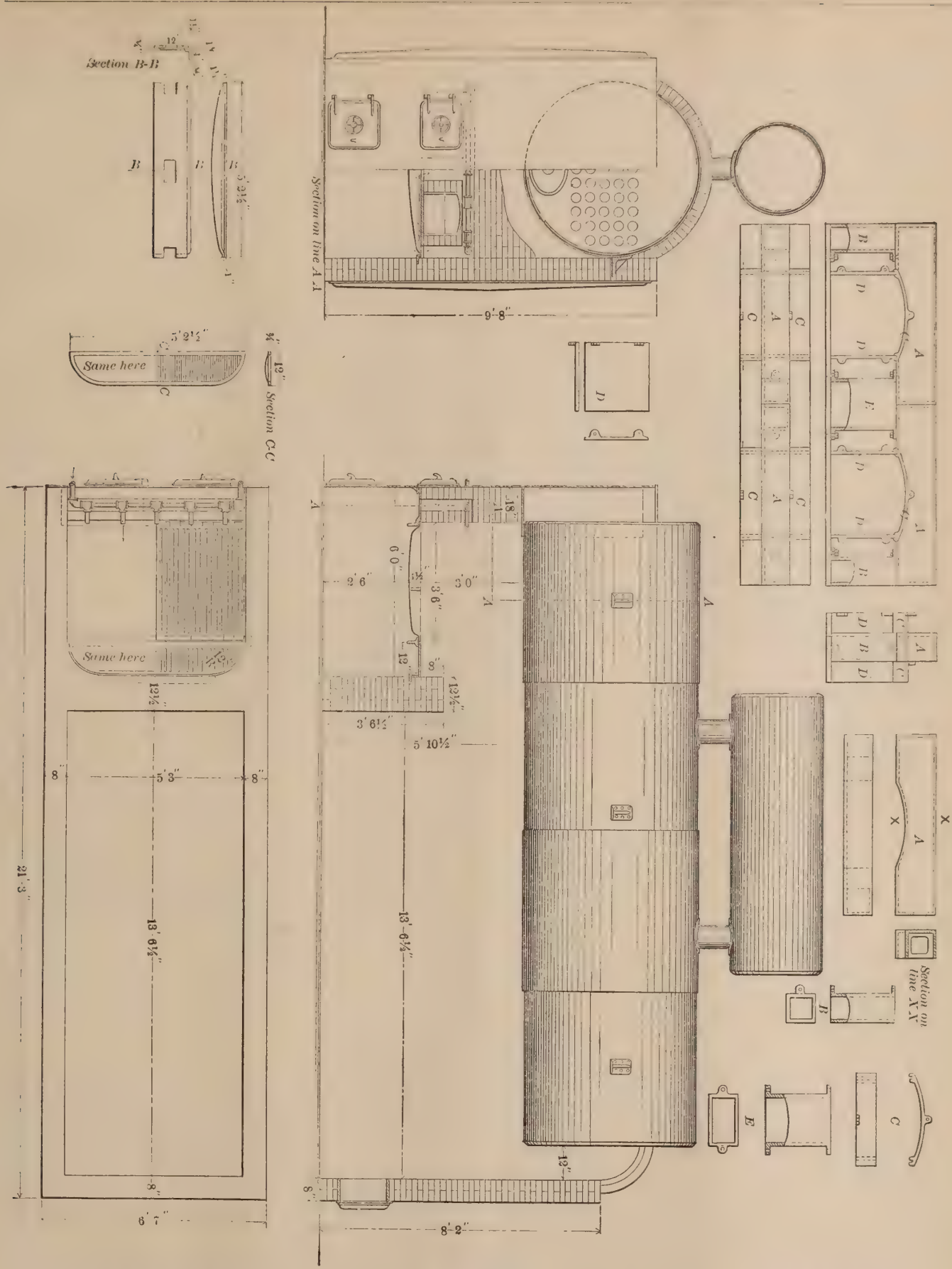
Lynn, Mass.: The outfall sewer, designed by Rudolph Hering is to be completed.——Meriden, Conn.: The sewerage plan has been adopted by public vote. About $70,000 is now available for sewer construction.——Upper Ansonia, Conn.: City Engineer Shedd, of Providence, will report on a plan for sewerage.——Lansingburg, N. Y.: An appropriation of $68,000 has been made for Crosstown sewers.——Williamsport, Pa.: A bill has been passed appropriating $25,000 for house and storm water sewers.——Manchester, Va.: Plans and specifications for a sewerage system have been prepared by Col. Waring; and it is proposed to issue bonds for $75,000 for the work.——Brunswick, Ga.: Proposals for the construction of sewers will be received soon.——Lorain, Ohio: A sewer system is projected.——New Albany, Ind.: Sewers are to be provided for in the tax levy.——Des Moines, Ia.: An ordinance has been passed for establishing sewers in North Des Moines.——Fairhaven, Wash.: The Council Committee on Sewers has been directed to advertise for bids for the construction of the sewers authorized in August.——Winnipeg, Man.: As many brick sewers will be constructed before cold weather as possible, so that the work on the pipe sewers can go on during the winter.

WATER WORKS NOTES

Pittsfield, Mass.: An additional supply is under consideration.——Antrim, N. H.: A committee has been appointed to report on works Nov. 3.——Brattleboro, Vt.: The company talks of increasing its supply.——St. Albans, Vt.: L. A. Taylor, Boston, has recommended the building of a 145,000,000-gallon impounding reservoir above the present one at an estimated cost of $34,000.——West Albany, Vt.: M. B. Chafey is Secretary and Ira Sanders Treasurer of a newly-organized water company. Proposed supply, springs, by gravity.——Cambridge, Mass.: An appropriation for $30,000 to lay 20,000 ft. of pipe has been requested.——Cincinnati, O.: The Committee on Water Works will investigate and report upon the inadequacy of the works and remedies for the same.——Ithaca, O.: It is reported that this place will soon have works.——Tiffin, O.: It is reported that a new system will be built.——Elk Rapids, Mich.: The Elk Rapids Water Supply Co. was incorporated Sept. 12; capital stock, $30,000.——Buchanan, Mich.: The first election having been illegal a second one has been held, resulting in a vote of 282 to 18 for $50,000 of bonds for works.——Emden, Ill.: C. H. Scholz is advocating the building of works.——Elgin, Tex.: An experimental well will be sunk with a view to building works.——Gatesville, Tex.: It is reported that works are to be built.——Gonzales, Tex.: It is reported that the Gonzales Water Works Co., has sold their works for $20,000, and that new mains and machinery will be put in.——Jacksonville, Tex.: Works are talked of.——Quanah, Tex.: Works are still projected.——Brighton, Col.: The people have voted for works. It is proposed to have them in operation by Jan. 1.——Brightam City, Utah.: An effort to secure works is being made.——Alfred Centre, N. Y.: The people have voted to build works.——Comanche, Tex.: Works are wanted.——Stoughton, Mass.: A move toward a better water supply is being made by the town. The present works are owned by a company.——Newport, R. I.: It is reported that new reservoirs will be built.——Carrollton, Ga.: The senate has passed a bill authorizing an election to vote on the issuance of water bonds.——Richland, Ga.: A bill permitting the establishment of works has passed the Senate.——Greenville, Tenn.: Address H. R. Brown, Secretary Water-Works Committee, concerning bids for works.——Harrodsburg, Ky.: A majority of 136 have voted in favor of works.——Jersey City, N. J.: There is considerable agitation for a new water supply.——Duncannon, Pa.: The Duncannon Water Co. was incorporated Sept. 24; capital stock, $25,000.——Deadwood, S. Dak.: The supply furnished by the company is said to be bad. A committee has been appointed by the Council to confer with the company, and, in case no satisfaction is obtained, to investigate the possibility of a supply from another source.——Auburn, Neb.: An attempt to secure works is being made.

BIDS AND CONTRACTS.

Roanoke, Va.: Bids are invited until October 20, for the construction of about 2,000 of brick sewers. Address J. J. Sheehan, Chairman Sewer Committee,——Williamsport, Pa.: Until October 15, bids will be received for the construction of approximately 17,500 feet of sewers. H. C. Reeder is city engineer.——Ft. Worth, Tex.: Bids are wanted until 3 P. M. Oct. 19, for constructing and furnishing the material for a water works system. J. P. Smith is Mayor.——Beardstown, Ill.: Bids are invited until October 14, for the construction of a system of water-works. Address H. M. Schmoldt, Chairman Committee on Water-works.——Dallas, Tex.: Proposals are wanted until October 19, for the construction of a system of water-works. Address the City Clerk.——Eagle Pass, Tex.: The City Council will receive bids until October 20, for a complete system of water-works, with a capacity of one million gallons a day. Information will be furnished by Cheney R. Prouty, Mayor of the city.



HUTCHINSON'S WATER GAS FURNACES.

The above cut is a detailed drawing of the Hutchinson Water Gas Furnace applied to stationary boilers. This is the only practical method of abating smoke nuisance on all constructions of furnaces. The system is just as applicable to locomotive or tug boilers as the stationary or returned flue boiler. The principal consists of converting a furnace into a Water Gas Furnace by supplying Oxygen and Hydrogen and taking up the Carbon as it is generated from the burning fuel. There are over 5,000 of these furnaces in successful operation, which is sufficient proof that it is no hardship to abate the smoke nuisance but on the contrary is a matter of economy to consume the gas under the boilers which usually passes of in the form of smoke and soot. Steam users generally speaking are scattering about 25 per cent. of fuel over themselves and neighbors. By the use of this device there is no fuel wasted, and all the gas is consumed immediately under the boilers leaving no soot or settlement to lodge in the flues or stick to the bottom of the boiler covering the surface of the iron with a non-conducting substance of greater density than asbestos. For further particulars address,

W. S. HUTCHINSON, 6 Washington St., Chicago.

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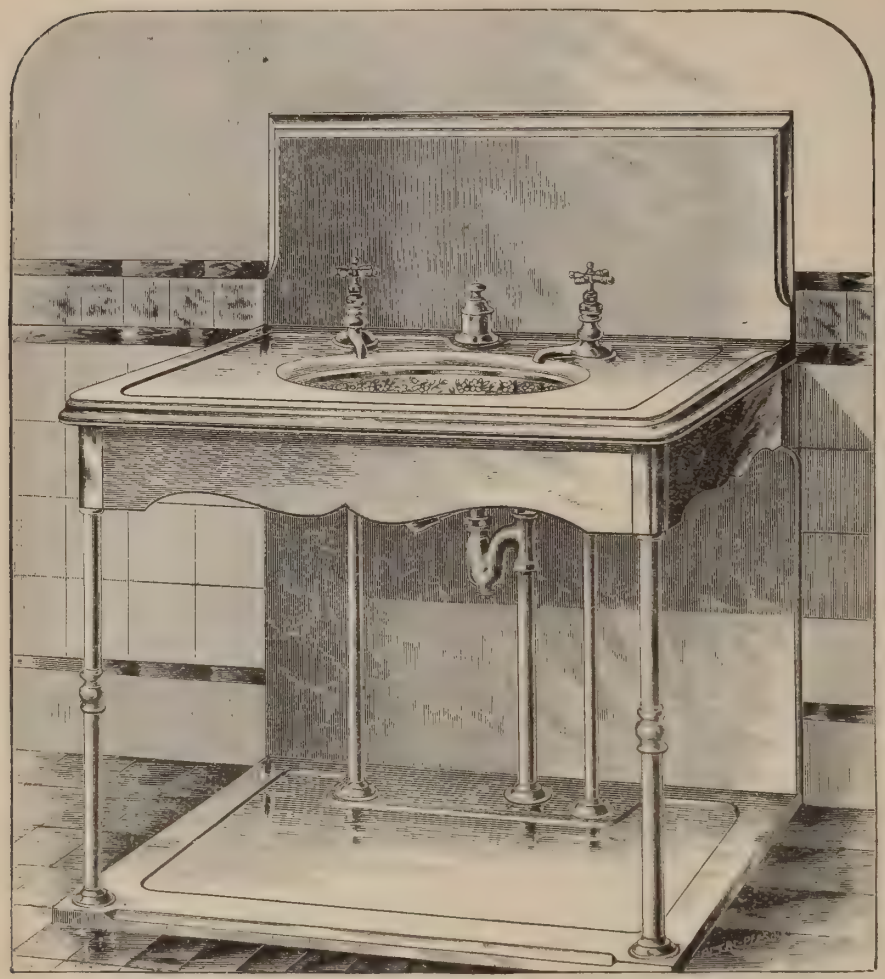

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Peter Riede, 4-sty and bst brk str and flts, 25x 85, 1015 Ogden ave	10,000
Lincoln Brooke, 2-4 sty and bst brk apmt bldgs, 50x85, 3242-44 Wabash ave	40,000
Michael Hofert, 4-sty and bst brk str and flts, 25x78, 543 W. 12th st	5,500
T. J. Rynertson, 3-sty and bst brk flts, 21x68, 331 N. Hoyne ave	6,000
Valentine Knoblock, 6 2-sty and bst brk strs and flts, 125x50, 1631-44 W. Ohio st	14,000
Mrs. Donahue, 3-sty and cel brk str and flts, 24 x70, 1901 W. Madison st; a, Geo. Grussing	6,000
A. M. Rothschild, 3-sty and bst brk dwlg, 40x 87, 3727-29 Michigan ave; a, L. B. Dixon	40,000
W. W. Kimball, 5-sty brk addn to fcty, 210x40, 26th and Rockwell sts	20,000
S. S. Date, 3-sty and bst brk dwlg, 26x51, 817 Washington Bld	10,000
E. G. Lewis, 3 3-sty and bst brk flts, 56x77, 576-78 Washington bld	21,000
Geo. D. Rumsey, 8 1-sty brk cttgs, 20x32, 404-20 Homan ave	5,600
J. A. Modine, 5-sty and bst brk str and flts, 24x 56, 209 Oak st	8,000
Geo. Shipp, 3-sty and bst brk flts, 22x52, 642 So. Fairfield ave	5,000
L. W. Noyes, 1-sty brk stck rm, 1242-48 Fillmore st	5,000
Charles Chapman, 2 3-sty and bst brk flts, 32x 69, 430 Claremont ave	12,000
Mary F. Jackson, 3-sty and bst brk flts, 22x65, 633 Fullerton ave	6,000
L. Martens, 2 3-sty and bst brk flts, 38x55, 1367-73 Van Buren st	10,000
Lincoln Brooke, 3 3-sty and bst brk flts, 55x82, 6031-38 Park End ave; a, Robt Rea	30,000
B. F. Conkrite, 3 and 2-sty and bst frm dwlg and brn, 35x30, 46th st nr Ellis ave	7,500
W. J. Haerther, 8 2-sty and bst brk flts, 160x70, 5509-23 Madison ave	45,000
Mrs. Rhoda M. Coffin, 3 3 and 2-sty and bst brk dwlgs, 62x72, Lake and Oakenwald aves	30,000
Wilson Palmer, 3 3-sty and bst brk flts, 21x53, 7720-24 Wallace st	7,000
L. C. Degener, 4 2-sty and bst brk flts, 24x60, 7627-38 Stewart ave	16,000
Jno. C. Hoop & Co., 4 2-sty and bst frm dwlgs, 20x37, 534-38 Leland st	7,000

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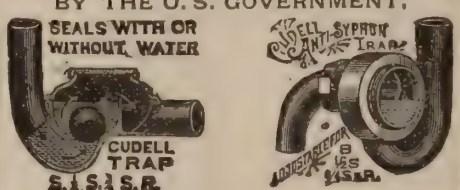

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COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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The plumbers are getting to work, in some parts of the country, with a view of fixing prices at a reasonable rate. This is right. There is no use of working for nothing, when good prices can be had.

* * *

No plumber of the National Association of Master Plumbers need feel that they are at all inferior to any other plumber. Those who do not belong to the association are out of many good things they could have by joining. They may not know it, but it is as truly as anything, and if they would once become a member, they would never regret it.

* * *

It is not true that all plumbing jobs are above a reasonable profit. The majority of plumbing contracts are below a fair profit on the work, and it does not seem right that they are so. Occasionally the plumber gets hold of a fair-minded man who wants the best plumbing job put in, and he is lucky in getting the job, but the majority of plumbing is not up to the standard of fair profits. The plumber has to buy his material of all description and do the work. The purchase of material is not considered chiefly by the building owner and he thinks the work is high. But take the price of material off and it will be found that the plumbing work is very low.

* * *

The old wooden dust bin is a most undesirable thing to have in the vicinity of any house. The wood absorbs impurities, so that it is continually giving off an unwholesome smell. The best dust bins are those of metal with a non-corrosive surface. The circular form is to be preferred, because corners retain impurities.

* * *

The subject of lead poisoning in Sheffield from the contamination of the water supply by contact with lead pipes has, says the *Lancet*, been one of the most important problems offered for solution during more recent years. Of special interest, therefore, will be the report which has just been drawn up by the expert members of the sub-committee which was appointed by the Water Committee of the Corporation on February 12th, last year. This report promises a settlement of the long-vexed question. In accordance with the resolution adopted at the conclusion of the public inquiry held in March, 1890, the water supply to the town has since that time been continuously treated with chalk for the purpose of preventing contamination by lead. The medical and chemical experts then expressed unanimously their satisfaction with the means successfully adopted to effect the removal of the cause of complaint, and also their approval of the permanent continuance of the process now in operation. The report concludes:—"That, with a view to the security of the community using the water from liability to injury from lead contamination, the process now adopted for treating that water with carbonate of lime in the form of chalk, or such modification thereof as experience may show to be an improvement thereon, be permanently continued; and that, for the more satisfactory and economical application of the process, such apparatus be provided and fitted up as will permit the addition of the material to the water in an automatic manner." It is further added that "it is important for the process to be regular and continuous, because if it were intermittent other chemical complications might occur."

* * *

The disposal of garbage and street refuse is needed on some streets in this city very much. Papers and all manner of dirt are left about in the streets and some wagon along these streets would be very acceptable.

* * *

Though the vault ordinance was not passed in its original form, Dr. Wingate, of Milwaukee, expresses satisfaction that the measure has finally passed the Council. The ordinance prohibits the construction of new vaults in certain districts in the city, and provides that each new vault shall be water tight and shall not be placed within two feet of a lot line. The ordinance as originally drafted prescribed the material of which and the manner in which new vaults should be constructed. Dr. Wingate states that the ordinance is a most important one from a sanitary law, and he trusts that public opinion will back him in his endeavors to enforce it. The law passed by the last Legislature gives the health department power to condemn vaults which are in an im-

perfect sanitary condition, and the ordinance will prevent a new vault from taking the place of the old one, if the locality be one where water and sewer connections can be had. There is no excuse for privy vaults where there are water and sewer connections. These can be arranged for in the houses by closets, and will be clean and perfectly healthful.

* * *

Why are all reputable plumbers calculated to arrange house supplies of plumbing and drainage correctly? They are every time looked upon with full and complete sanitary construction and apply these to buildings. They have been properly put to work learning their trades and have a knowledge of the subject perfect in every respect. They can be relied on where the building owner wants the plumbing work properly done, and is willing to pay the proper amount for that kind of plumbing. They are prepared for all kinds of work and take pleasure in a first-class job, consisting of first-class material and first-class work. Give the reputable plumbers a chance and they will fix up your houses in accordance with sanitary laws.

* * *

No one likes to see a jerry plumber go to work. In the first place he will not do good work, and in the second, he is doing the work he should have left for those who studied their trade and became efficient at it to do. There are men employing that kind of men, knowing full well that they do not do their work properly, and they do not want them to. They will have no other plumbers about them but these same kind of men. It is a trade within itself, this trade of knowing no trade and still trying to follow that of the plumbers. You will find some little fellow of them wherever you go, or whatever city you stop at. No man building a house for himself to live in wants them working on it. But the man who builds houses to sell, put them up and speculate on them, may be found any time with a lot of these men under his employ. Every man, whether he wishes to hire, buy, lease or have one given to him, has a right to see that the proper plumbing has been put into them, and put in properly. No man can make a bigger mistake than to be fooled in this one particular. Whatever the source that the house comes from be careful what kind of plumbing you get.

* * *

The American Public Health Association will meet in Kansas City, October 20-24, 1891, and will in all probability be one of the largest conventions held. This Association was organized in 1872, by a few public-spirited men who foresaw the need of bringing together in one body the ablest sanitarians in the country, for the purpose of inaugurating measures for the restriction and prevention of contagious and infectious diseases, and for the diffusion of sanitary knowledge among the people. The growth of the Association and the work it has accomplished more than justify its existence. Its membership has been augmented from year to year until it now constitutes the largest and strongest sanitary body in the world, and embraces in territorial extent the United States, the Dominion of Canada, and the Republic of Mexico. Under the impetus given by its work, state and local boards of health and sanitary associations have been organized, sanitary publications increased, and hygienic knowledge widely and extensively diffused. Much good have they done in many ways, and now as they go to hold their nineteenth annual meeting let us wish them much success.

NOTES AND NEWS.

One marriage out of four in Japan invariably ends in a divorce.

In almost all the manufacturing towns Europe, during the last half century, schools have been opened for apprentices in the industrial arts.

A German biologist says that the two sides of the face are never alike. In two out of five the eyes are out of line; one eye is stronger than the other in seven persons out of ten, and the right ear is generally higher than the left.

Whatever kind of a chimney you have, see that it is smooth inside. The rougher it is inside, the less the draught will be. A round section costs rather more to build, but is a trifle the better shape.—Robert Grimshaw's Hints to Power Users.

Zinc expands up to the melting point. A bar of hammered zinc 6 in. long will expand 1,100 in. in raising the temperature 100 deg. F.

An international exhibition is announced to be held at Odessa, in 1894, under the auspices of the Russian Government.

For users of steam power who are not skilled mechanics or not accustomed to run engines, a unique type of engine construction has, says a contemporary, lately come into vogue. It consists of a moving steam cylinder and moving valve, and a stationary steam chest, thus dispensing entirely with various mechanical arrangements, commonly employed, such as the eccentric valve rod, complicated connecting rods, slides, rockers, etc.

A French contemporary notices a curious electric ventilator for supplying a building with fresh air, either cold or warmed, as desired. An electric motor sets the ventilator revolving, and the revolution sucks cool air in. When warm air is desired, a current is sent into a network of fine wire possessing a high resistance, and through the network the air is obliged to pass; the current heats the wires and the air necessarily becomes heated. The movement of a commutator is sufficient to change the character of the air supplied by the ventilator. This system is capable of considerable adaptation, and it is stated that the hygienic results are uniformly good.

In order to make a luminous paint, oyster shells should be washed and cleaned well in warm water, and put into a fire for half an hour and then taken out. When quite cool, pound them fine, taking away the grey parts, as they are no use, put the powder into a crucible in alternate layers with flour of sulphur, put on the lid, seal up with a paste of sand and beer; when dry, place on the fire, and bake for an hour; when cold, take off the cover; separate all grey parts; mix into a thin paint with fine varnish. Previous to applying, the article to be painted to have two coats of white lead and turpentine, to form a body ground for the luminant.

By frequent heating steel loses its carbon and comes therefore nearer to iron in quality; it is then said to be burnt. According to a German paper the steel qualities of the metal may be restored by repeated heating to redness and immersion in hot water. Burnt cast steel may be rehabilitated in the following manner: Melt three parts by weight of good and pure colophony in a crucible, the mass to be slowly and continuously stirred, and then add, while stirring, two parts of boiled linseed oil, taking care that the mixture does not catch fire. The product, a brown viscid mass, will, it is stated, render burnt cast steel better than it was in the original state if the metal be heated to incandescence and repeatedly immersed in the mixture.

THE SANITARY REGISTRATION OF DWELLINGS.*

The purpose of this paper is to enforce the view that all dwellings hereafter to be built and certain classes of dwellings already erected should be provided—first, with a system of house drainage so arranged and constructed as to guard the inmates from the noxious influence of so-called sanitary appliances; secondly, with a protected indoor water supply as distinguished from a wholesome supply at the fountain head; and lastly, that the dwellings referred to, when so provided and on production of sanitary certificate granted by competent authority, should be entered in some competent register.

It cannot be denied that the existing legislative provisions as to house drainage and water supply protection are insufficient to maintain the degree of safety necessary for preserving health, and although other matters appertaining to house sanitation deserve consideration, the two subjects mentioned demand urgent attention, and ought to be dealt with more effectively by competent authority. While adequate ventilation of a house, inodorous surroundings and other matters are of considerable importance, many of them are largely dealt with by existing law. Further, there is this marked difference between some of these usual requirements and those especially pressed by this paper. Bad ventilation and ill-placed dustbins are obvious defects, the purchaser or hirer of a house cannot say that he is misled or deceived, and the maxim *caveat emptor* applies. But with regard to faulty arrangements in the domestic closets and waste pipes and defective and ill-contrived water-cisterns the case is different. The offend-

*A paper by Mr. Henry Rutherfurd, barrister-at-law, delegate from the Sanitary Assurance Association, read at the International Congress of Hygiene and Demography.

ing point may be discoverable only by the observing powers of an expert or may be concealed from every one until revealed by illness or the breaking up of a building. The mischief is insidious, and as the emanations from sewer connections are of serious consequence to inmates of dwellings it seems only reasonable to draw a distinction between the open and obvious defect and the insidious approach of a concealed danger, and to urge that to meet this danger Government action may be properly invoked.

It is no doubt true that existing law provides that water-closets or equivalent arrangements shall be supplied and that drainage shall be attended to, and it is also the case that under certain circumstances and after certain formalities, entrance of officials into occupied dwellings is authorized to ascertain that the necessary sanitary conveniences have been provided. But it does not appear that a faulty construction of such appliances can be dealt with unless the fault is glaring and the evil therefrom amounts almost to a nuisance to outsiders. In order, therefore, to enabling intending occupiers of new dwellings to be saved from injury it is essential not only that these should be provided with the usual appliances, but that they should be inspected and pronounced good in themselves and suitably adapted to those dwellings. For otherwise the mere requirement that domestic conveniences shall be provided almost amounts in many cases to a statutory obligation to undergo illness or suffer death.

In regard to the water supply, the point now urged is that water for drinking should be protected after its introduction to the house, for obviously, however good it may be at the fountain head, this is of little advantage if it become affected by pollution within the walls of the dwelling. Protection from this should be insisted upon both as regards possible contamination by emaaations from discharge pipes and also as regards the position of the drinking-water cistern, so that it shall not be a receptacle for dust or inaccessible for purposes of investigation or periodical cleaning.

With regard to existing dwellings, however, the difficulty of rigorously enforcing such requirements is very great. To insist upon all such buildings being brought at once (even if it were practically possible) to the ideal standard of sanitation would, by reason of the heavy cost and the occasional disarrangement of the buildings, prove an unreasonable demand upon the resources of individuals. But it is conceived first that, without in such cases quite approaching the ideal standard, a minimum standard might be adapted which would still be of considerable sanitary value. Next that the lower standard might be enforced after the completion of a long tenancy or period of years.

As to water, however, whatever minimum of house sanitation experts might consider sufficient, I trust it would not be deemed too severe a demand if, as to protection of drinking water there should be but one standard.

In regard to the use of the word "dwelling," the term is here intended to apply both to residential houses and to all buildings wherein human beings are employed or engaged for any number of consecutive hours. It is not forgotten that the present law, by the Factory and Workshop Acts, the Common Lodging Houses Acts, and others, deals with numerous special cases, and that already some overlapping occurs. But for the purpose of this paper there is much ground that those Acts do not cover, and when such statutes are in effective operation it is not proposed that they should be interfered with by further legislation. It has been stated that with existing dwellings a different standard of sanitation might be accepted and time given for its adoption. With regard, however, to certain classes of such dwellings, I would urge that legislation should at once intervene. I refer to the case of hotel and lodgings and to Board Schools and other institutions under local control.

The reason for demanding the sanitation of such existing buildings is, that with hotels the public have not always the opportunity of choice. Arriving from the country or from abroad, the stranger in a town must go to such quarters as are available, and the very purpose of hotels is to provide accommodation for travelers who of necessity can know nothing of the arrangements of a dwelling within whose walls they may, under the greatest urgency, be bound for a time to reside. And when we know that, perhaps at home, and certainly abroad, the traveler's life has been cut short by insanitary conditions of hotels, it does not seem much more unreasonable to demand protection from such evils than to insist that for some hours daily there shall be no sale of alcohol.

Lodgings, though not quite in the positions of hotels, are included therewith because where the business is a regular occupation the functions of the lodging-house are very similar and the position of the guest almost equally defenceless.

Board schools are placed in the same category, because attendance of the children are compulsory, and they neither know nor care about sanitary arrangements As to the parents they are probably altogether excluded from an opportunity of inspecting those departments, and it is quite possible that even if it were granted and the conditions of affairs were grossly unsatisfactory the parents would come to the conclusion that, in comparison with their own, the arrangements were salubrious and even attractive.

It may be urged that the compulsory action suggested is, in the case of public institutions, unnecessary and vexatious. Without saying that my experience of such cases is extensive, I can state that instances of a very gross character have occurred. Where, in very large buildings under the control of a School Board, the sanitary arrangements had been pronounced faulty and dangerous to health, and several deaths had ensued therefrom, the Board nevertheless failed to take such action as was necessary, and the schools were after the holidays reopened on the alleged ground that there had not been time or it was not then convenient to carry out the operations so imperatively required.

To an audience of this character it would be vain to attempt by reciting sensational cases to enlist their sympathies convincing their reason, but certainly it would not be difficult to illustrate the point at issue by other examples of grievous suffering and distress inflicted upon the young, the weak and the helpless.

We have now to inquire as to the sanitary registration of the buildings referred to. It is conceived that the best mode of enforcing the observance of sanitary regulations is to establish a public register in which to enter a reference to every building which has complied with such regulations, and to provide that no buildings should be inhabited until so registered. The registration would be effected on production of a certificate of due sanitation from some competent authority. Then inasmuch as the sanitary condition of a house may vary with lapse of time, it is proposed that quinquennially an inspection should be made, and the fact, if all be found in order, endorsed on the certificate. But if any discovered evil should within a certain period not be remedied, the house would then at once disappear from the register. In the case of change of tenancy during the quinquennial period, or structural alterations endangering the sanitary arrangements, it should be obligatory on the house owner to obtain inspection and notify results to the sanitary registrar.

In this connection it would be well to consider whether encouragement should not be given to the voluntary sanitation of dwellings, for the time being excluded from compulsory regulations, by entering them in the register when duly certified, on such easy terms as to fees and otherwise as might be thought expedient. It is probable that many house proprietors would be willing and eager to conform to such modified regulations with the view of attracting tenants, or securing more remunerative rents, the result in either case being to the benefit of society at large.

The question still remaining is that of the persons or parties competent to issue the sanitary certificates. Whilst admitting to the full that the educated official persons at present in charge of the public health are competent and desirable authorities to grant such certificates, it is considered that the power in question ought not to be confined to the officials of the state. Sanitary science is still young, and it may be that progress would be more surely made by extending the power to certify to such medical men, architects, engineers or associations as have themselves, or through their staff, recognized diplomas of sanitary knowledge. Just as under the Vaccination Acts, while the act of vaccination is often performed by official persons, the statute may be complied with through means of other persons, provided they are qualified by diplomas of recognized validity.

It is not denied that some difficulty may arise on this part of the subject, and the limits allowed will not permit of its being fully dealt with. But it may be suggested that the reckless or fraudulant issue of certificates could be met by severe penalties,

while the offenders would still be left open to the public trial of a civil action for damages at the suit of any injured party.

Lastly, although the measures recommended in this paper may not be "heroic," it is submitted that they are worthy of consideration, and that their adoption would to no inconsiderable degree work for the general good. In asking for state interference, it must be remembered that we are making fresh invasion on private liberty, and we ought not to extend this invasion further than is absolutely necessary. Also, the theoretical sanitarian is bound to consider what are the prospects of passing ideal schemes into effective law. The insistance of a very high standard may lead to immediate failure and possibly to a disastrous postponement. On the other hand, there can be no doubt that if, by the limited scheme here presented, dwellings should be provided with appliances of the character specified, examined in their respective positions and periodically supervised, a great improvement would be conferred upon the habitations of the people, slow and lingering disease would be diminished, the tone of the general health would be raised, and something will have been done to increase the happiness of many an individual home.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The nineteenth annual meeting will be held at Kansas City October 20th to the 24th, 1891. The local Committee of Arrangements announces that all railway passenger associations of the country have granted a one and one-third fare rate for the round trip on the usual certificate plan, that is:

(1.) Procure a certificate of attendance from the agent at the starting point by paying full fare to Kansas City.

(2.) Have the certificate of attendance signed by the proper officer of the Association at Kansas City. This certificate will then procure return ticket for one-third fare. All the leading hotels of Kansas City will give special rates to delegates. Arrangements are being perfected for an excursion into Kansas, as one of the features of the entertainment of the Association. For any information as to the meeting, address

Dr. E. R. Lewis, Chairman; or
Dr. Joseph Sharp, Secretary.
Local Committee of Arrangements, Kansas City, Mo.

CONVENIENT TO HAVE ABOUT.

The skin of a boiled egg is the best remedy for a boil. Carefully peel it, wet, and apply to the boil; it draws out the matter and relieves soreness.

For a good solution for removing the blue from steel, so as to leave as clean as before coloring, try acetic acid, or solution of chloride of tin (stannous chloride).

In buying cooked lobsters remember that a lobster that was alive when thrown into the boiler will have the tail curled up to the body, while one that was dead has the tail extended.

Artificial grindstones, made of a mixture of pulverized quartz, powdered flint, powdered emery or corundum and rubber dissolved by a suitable solvent, are now said to be made for sharpening tools which outwear by years any natural stone known.

A blotter can be made that will remove ink spots from paper. Take a thick blotting paper and steep it several times in a solution of oxalic acid or oxalate of potassium. While the ink spot is still moist apply the prepared blotter, and the ink will be entirely removed.

A most remarkable alloy of gold and aluminum is now under the examination of scientists. It is of a beautiful, rich purple color. This royal metal will make a handsome addition to those now used for purposes of adornment. From all accounts it seems amendable to the methods of jewelers in making their gold ornaments.

For users of steam power who are not skilled mechanics or not accustomed to run engines, a unique type of engine construction has, says a contemporary, lately come into vogue. It consists of a moving steam cylinder and moving valve, and a stationary steam chest, thus dispensing entirely with various mechanical arrangements, commonly employed, such as the eccentric valve rod, complicated connecting rods, slides, rockers, etc.

To make artificial ivory that will not dissolve in water, mix eight parts shellac with thirty-two parts strong ammonia and agitate for some hours in a closed vessel. After solution mix with it forty parts zinc oxide in a paint mill. Expel ammonia by heating, dry, grind, and press into shape at a temperature of 500° to 540° Fah.

A good paste is made by soaking flake tagacanth in sufficient cold water that the brush will not sink into the paste when finished. To prevent souring, add to the water 2 grains of hydronaphthol (dissolved in a little alcohol) for each pint, and a few drops of clove oil for scent. To keep away the flies add some oil of pennyroyal. Avoid, in making pastes, oil of wintergreen and carbolic acid, for these produce a purplish discoloration by contact with the tinned iron of the brush.

A good recipe for renovating carpets, to restore the colors and remove stains. First beat the carpets thoroughly. Then after they are tacked down, wash them with warm solution of one part ox gall to twenty-five parts water by measure. Mix and use a little of the solution at a time, so as to have it always warm and clean.

An excellent powder for welding wrought iron is described by a German contemporary. If consists of borax, 50 per cent.; sal ammoniac, 25 per cent.; and water, 25 per cent. This mixture is boiled, being at the same time continuously stirred until it is reduced to a stiff mass, which is then held over a fire until it becomes hard. When cold, the mixture is well pulverized and assimilated with one-third part of rust-free wrought-iron filings. The pieces to be welded are first dovetailed, or otherwise connected; the welding parts are then heated to redness, when the powder is strewn over them and allowed to liquify over the fire. Only very slight blows are then required to consummate the perfect conjunction of the pieces.

TWO-INCH DRAINS VERSUS SIX-INCH DRAINS.

READ BEFORE THE CONGRESS OF HYGIENE AND DEMOGRAPHY BY G. M. LAWFORD, ASSOC. M. INST. C. E.

It is a matter of every-day occurrence to find a 6-inch pipe used for the drainage of a single house, and this size is usually made compulsory by sanitary authorities, whether metropolitan, urban or rural.

As a house drain is frequently dry for several hours at a time, it is obvious that where pipes of this diameter are used there must be a considerable extent of surface on which sediment is deposited, and as a natural consequence, during the periods of minimum flow this deposit will decompose and foul gases will be generated. If the house drain is properly disconnected from the main sewer, and efficiently ventilated, a large proportion of these gases will undoubtedly be carried off and liberated in the atmosphere, but the tendency of the remainder will be to move in the direction of the house by reason of the absorptive influence of the warmer air within.

The author contends that this generation of gases in the house-drain, apart from its being adverse to the principles of sanitation, is preventable, the remedy lying in the use of smaller pipes. Taking as an example the case of an ordinary sized town house, with an average of 10 inhabitants, and allowing 30 galls. of waste water or liquid matter to be discharged per head per day, the total volume would be 300 galls. per day, and of this amount at least one-half must be reckoned as being discharged in 6 hours, this giving 25 galls. per hour as the maximum flow to be provided for. To this amount must be added the rainfall from the roof and areas which, as a rule in the case of town houses, is taken into the sewer. The superficial area to be dealt with under this heading varies from 1,000 to 10,000 sq. ft.; taking 6,000 sq. ft., which is considerably in excess of the average, and allowing for 1¼ ins. of rainfall per hour (thus providing for the heaviest thunderstorms), the total volume of rainfall to be dealt with would be 3,900 galls. per hour. The maximum hourly discharge of sewage and rainfall combined would therefore be 3,925 galls., or 65.4 galls. per minute, and a 4-in. pipe will discharge this amount when running full at the very flat gradient of 1 in 207.36, the velocity produced being 2.02 ft. per second, which is barely sufficient to make a drain self-cleansing.

As the conditions on which these figures are based are only likely to occur once or twice a year, if at all (*i. e.*, during an exceptionally severe thunderstorm), it is evident that without special

arrangements for flushing, even a 4-in. drain can scarcely be made absolutely self-cleansing, more particularly as the usual gradient is from 1 in 40 to 1 in 60, witn a consequent increase of discharging capacity.

The author therefore considers that under ordinary circumstances a 4-in. drain is ample for an average sized house, and that a 6-in drain is too large to be kept free from deposit, more particularly as the majority of the pipes discharging into it are 3 ins. or less in diameter. Baths, lavatories and sinks never have waste pipes exceeding 2 in. internal diameter, and it is the exception to find more than one appliance being discharged at a time. The question therefore naturally arises "How can a 2-in. pipe possibly flush and cleanse a pipe nine times its own sectional area?"

The soil pipe is the only pipe of larger size which ever discharges at full bore, and the amount discharged at one time (2 or 3 galls. at the most) is insufficient to make a 4-in. horizontal drain run even half full for more than a few feet.

Automatic flushing is of the greatest assistance in keeping a drain free from deposit, and should be adopted in all cases where possible, and more particularly in cases where, from the depth of the main sewer, the inclination of the house drain exceeds 1 in 60.

A tank containing not less than 30 galls. is sufficient to cleanse a 4-in. drain by means of a 2-in. syphon and flushing pipe, and it should be placed at the extreme end or head of the drain, at least 6 ft. above the latter point.

The author maintains that by using a 4-in. drain laid at a uniform inclination not exceeding 1 in 60, aided by automatic flushing, all refuse and other matters discharged into it will be removed in the shortest time and with the minimum of deposit, and those who say that a 4-in. drain would be choked by such extraneous objects as a duster, a medicine bottle, or a hair brush, the saying, "a place for everything and everything in its place" may be aptly quoted, as a house drain cannot obviously be the proper place for a hair brush, and the removal of such articles can be effectually provided for by making every length of drain accessible from inspection chambers.

Another argument in favor of the 4-in. pipe is the increased circulation of air in the drain, as by diminishing the sectional area of the passage the velocity of the air current is considerably accelerated; the volume of air which has to be set in motion in order to produce circulation in a 6-in. pipe being more than double (2.24 times) the volume in a 4-in. pipe.

Gases generated in a 4-inch drain would certainly be carried away more quickly than in a 6-in. drain, apart from the fact previously stated that the possibility of a creation of such gases in a 4-in. drain is reduced to a minimum, while in a 6-inch drain their existence is an absolute certainty.

To summarize briefly, the objection to a 6-in. drain is the fact that deposits must be formed from which noxious gases are generated, with the probability of contaminating the air in the house, while the advantages of a 4-in. drain are:

(1.) Deposit is reduced to a minimum;

(2.) Its size is ample for the discharge of the greatest amount of waste and rain water that can possibly pass into it;

(3.) When combined with automatic flushing at regular intervals, absolute cleansing is obtained; and

(4.) The increased strength of the air currents and the consequential more effectual and rapid purification of the drain.

The author would therefore, in conclusion, urge on all sanitary authorities the advisability of reducing the sizes of house drains as laid down in the exisiing by-laws and regulations, for while they all endeavor to exclude sewer gas from house drains by means of disconnection and ventilation, the question of its generation in the drains themselves has apparently been hitherto overlooked.

UNITED STATES PATENTS.

A United States patent will be granted to any person who has invented or discovered any new and useful art, machine, manufacture or improvement thereof not known or used by others in this country, and not patented or described in any printed publication in this or any other country before his discovery of invention thereof, and not in public use or on sale more than two years prior to his application, unless the same is proved to have been abandoned. In this connection the word "art" means the process or method of producing an old or new result.

If a method of doing anything contains one or more new steps, the process is new and patentable. The word "machine" means any device or thing by means of which a mechanical result may be produced, such as a pin, a churn or a locomotive. The word "manufacture" means a made up article, such as furniture, clothing, harness and the thousands of things which are offered for sale. "Composition of matter" means a chemical compound of ingredients, such as hard rubber, liquid glue, medicine, etc. Patents may also be obtained for designs for manufactures and works of art, for three, seven and ten years.

Trade marks may be registered for any arbitrary sign or symbol which is not descriptive; the government fee is twenty-five dollars. Such marks are the exclusive property of the registrar for thirty years, and the time may be extended. A "label" is any descriptive tag, print or impression to be placed upon any article or its case, and it may be registered for twenty-eight years. The government fee for a label is six dollars; but if it contains any special mark or symbol, the office decides it to be a "trade mark" instead of a label.—Washington Chronicle.

OVERWORK vs. OVEREATING.

The *Medical Mirror* says: An abuse that tends to the injury of brain workers is excessive eating. I recall to mind several active brain workers who suddenly broke down, and fancied that it was due to brain fatigue, when, as a matter of fact, it was due to over-stuffing of their stomachs. The furnace connected with mental machinery became clogged up with ashes and carbon in various shapes and forms, and as a result, disease came, and before the cases were fully appreciated, a demoralized condition of the nervous systems was manifested, and they laid the flattering unction to their souls that they had indulged in mental overwork. Hard work, mental or physical, rarely ever kills. If a mild amount of physical exercise be taken, and a judicious amount of food be furnished, the bowels kept open in the proper manner, the surface protected with proper clothing, and the individual cultivates a philosophical nature and absolutely resolves to permit nothing to annoy or fret him, the chances are that he can do an almost unlimited amount of work for an indefinite length of time, bearing in mind always that when weariness comes, he must rest, and not take stimulants and work upon false capital. The tired, worn-out slave should not be scourged to additional labor. Under such stimulus, the slave may do the task, but he soon becomes crippled and unfit for work. The secret of successful work lies in the direction of selecting good, nutritious, digestible food, taken in proper quantities, the adopting of regular methods of work, the rule of resting when pronounced fatigue presents itself, determining absolutely not to permit friction, worry, or fretting to enter into his life, and the cultivation of the Christian graces, charity, patience, and philosophy.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

We do not know just what is meant by some of the letters received and would be pleased to have persons wishing a clear answer ask clear questions. For instance, here is a letter received last week too late for last week's issue:

Will you please send me the name of some smoke preventor that will prevent smoke on locomotives, and kindly state whether it prevents smoke by consuming it, or if it just does not make any. The locomotives running into our city make the most smoke, and will not listen to any preventor which consumes smoke. Their idea is to get something, some device, that will not make any smoke from the beginning to the end, so there will be no doubt in the matter whatever. They want to employ that kind of a preventor and at the same time use soft coal for fuel. I will be thankful to you for any information you may furnish me concerning this point." Most truly yours. ———

I have replied to this gentleman the best I could in reference to this matter, but the question is, what difference does it make how the smoke is abated so that it is done? For the locomotives to use soft coal for fuel, prevent the smoke without consuming it, would, to our belief and experience, be a rather difficult thing to do. Smoke is the unburnt portions of the fuel escaping in a fine form and dispelling itself over everything about the locomotive, or the furnace in which it is burnt. To prevent that smoke

in any manner would seem to us the desirable thing to do. It would be better to consume it, as in that manner of ridding the atmosphere of it would be the most economical. It would in that way add its heating power to the boilers and serve to lessen the amount of coal burned. If the use of soft coal is to be a basis of smoke prevention, then a more perfect combustion or consumption of that coal is the best thing they can rely on. No fuel that has any carbon in it that will show after passing through their grates, will be reduced without burning it. Some device must be placed at the furnaces that will consume all the smoke made before they will have smokeless furnaces.

A clipping from Columbus, Ohio, seems to have a staggering point about it. The excerpt says:

George S. Beall & Co., Hasbrook, Orr & Byers, and eight other firms doing business on High street, between Gay and Long streets, petition the Board to abate, if possible, the smoke nuisance in that neighborhood. It was stated that the smoke pours from low stacks, entering their stores and destroying their goods. The Board did not know just what to do and referred the subject to the City Solicitor.

Now, the only thing the Board here would have to do would be to abate the smoke, to prevent it from being made and relieve these firms from the nuisance of it. Smoke is a great nuisance when it is once well-known. These firms have a good chance of judging of its harmful effects upon their goods in their stores. They have found out that the smoke is a nuisance, and have asked to have it abated. The Board did not know what to do and referred it to the City Solicitor. He will probably find some one he can refer it to for a while and that will probably be the last heard of the smoke nuisance.

The fact is there must be a city ordinance against smoke nuisance, authorizing some one to abate it. It is a shame that where private property, its value increased by the value of a city about it, is allowed to become smoked and black and depreciated in value, until its first cost is below its present. Smoke heaving up and pouring over it, leaving its smut and grime upon it, and making everything on the inside of it almost past touching. Smoke scattering itself throughout the cities as if it was wanted until the most valuable parts are black and so discolored that one cannot guess of what it was originally made. This city is the ruined columns of a once prosperous town. Progress started its manufactories, the buildings went up higher, the limits extended further until a happy and prosperous city was on the site. Then the smoke nuisance became a part of at first unobserved, but always gaining headway until now the whole city is enveloped in it, and right where the most valuable portions of it should stand, people hesitate about locating, going into business, or to do anything that would make a city grow and be prosperous.

There is but one way to prevent smoke. We have named it often in these pages, and if cities do not take hold of the subject earnestly and enthusiastically and carry it forward, they will regret it. It is not an easy thing to do when a city gets so big, but the many who have written to us, by far the most, are in small cities where they could accomplish the object without so much work. Begin with the first offenders, and do not let any smoke be made. This will settle the whole business.

HEALTH IN MICHIGAN, SEPTEMBER, 1891.

For the month of September, 1891, compared with the preceding month, the reports indicate that small-pox, puerperal fever, membranous croup, typhoid fever, pleuritis, diphtheria, influenza, cerebro spinal meningitis, remittent fever and bronchitis increased, and that measles, whooping-cough and inflammation of brain decreased in prevalence.

Compared with the preceding month the velocity of the wind was greater; the prevailing direction was south-west (instead of west); the rainfall was much less, the temperature was lower, the absolute humidity was slightly less, the relative humidity was slightly more, the day and night ozone was less.

Compared with the average for the month of September in the five years 1886-90, cerebro spinal meningitis, pleuritis, scarlet fever, small-pox, cholera infantum and typhoid fever were more prevalent and membranous croup, typho-malarial fever, inflammation and brain pneumonia, measles, erysipelas, influenza and puerperal fever were less prevalent in September, 1891.

For the month of September, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was the same, the prevailing direction was north-west (instead of easterly), the temperature was higher, the rainfall was much less, the absolute humidity was more, the relative humidity was less, the day and night ozone were less.

Including reports by regular observers and others, diphtheria was reported present in the month of September, 1891, at eighty-six places; scarlet fever, eighty-four; typhoid fever, one hundred and fifty-eight; measles, twenty-two, and small-pox, two places.

Reports from all sources show diphtheria reported at twenty-four places more; scarlet fever at five places more; typhoid fever at one hundred places more than in the preceding month; measles at same number and small-pox at two places.

Henry B. Baker, Sec'y.

Lansing, Mich., Oct. 8, 1891.

SANITARY MILK COMPANY IN BALTIMORE.

The Sanitary Milk Co. has been incorporated for the purpose of remedying the growing evil of impure milk. The capital stock is $100,000. The methods which it proposes to pursue are those which have been in large and successful operation in Berlin, Germany and in several other cities of continental Europe since 1881. These methods include a rigid inspection of the herds of cattle whose milk is used, careful sanitary regulations as to the stabling and food of the cows, daily tests as to the quality of the milk and to prevent its adulteration and absolute cleanliness from the time the milk leaves the cow until it reaches the consumer. Strainers and sponge apparatus like those used in Berlin will be used in the new enterprise so as to give the utmost purity. The cans and jars will be locked after being delivered to the driver of the wagon, and he will be unable to stop en route and make good with water any deficiency in his supply. A new species of wagon, resembling somewhat the mail wagons, will be adopted, and they will be bright and attractive. The driver and his assistant will be uniformed. The milk will be obtained from inspected herds of Jersey and other good grade cattle. It will be brought to a central station in the city, and will not be sent out until it has been inspected, tested and run through the cleansing apparatus to rid it of every impurity. It will be delivered in glass jars, all the vessels used being kept scrupulously clean. The methods of handling the milk will be open to the inspection of the public and the health department. The directors and officers of the new company are John R. Kelso, Jr., president; Edwin Warfield, vice-president; Samuel E. Hill, treasurer; John E. Dorsey, secretary and manager; Edwin J. Farber, attorney; Dr. George H. Rohe, ex-commissioner of health; A. Robert Carter, secretary of the board of health; Thomas Hill and Thomas M. Hulings.

ELECTRIC HEATING.

Within the last few months, the question of heating by electricity has attracted a marked degree of attention. One of the largest railway companies in the country propose to try the plan of heating its limited train by electricity, and if the scheme is successful—and there is no reason why it should not be—the example will naturally be followed by competing roads. The heaters will be installed as an attractive novelty, which all railway companies are anxious to secure for their fancy trains; but if the utility of the heaters is demonstrated, they will be generally adopted for more important reasons. Presumably all railroads in the country would be glad to discard the "deadly car stove" if they could find a satisfactory substitute.

Street car companies which used electric heaters last winter have almost without an exception found them successful, and not uneconomical. As to the cost of operation, it is stated that it is not much more than that of the coal which is used in the car stoves. The latter are dirty, and as a rule are extremely unreliable, but at the same time very faithful in the production of noxious gases, and distribution of ashes. Many a time in cold weather in Chicago the interior of the cars on the South Side is exceedingly uncomfortable on account of foul air.

But there is a demand for heaters even in houses. In several places in the West, and in Canada, where electric generators are operated by water power and where current is cheap, there is talk of installing heaters on quite a general scale.—*Electricity.*

FOR THE DIGESTION.

A stingy man can be relied upon to keep everything but his promise.—*Elmira Gazette.*

Your friends may not know much, but they know what they would do if they were in your place.—*Atchison Globe.*

The base drummer in a parade may be perfectly honest, notwithstanding the popular impression that he beats his way.—*Yonkers Statesman.*

Briggs—"Well, I must call upon my tailor." Griggs—"You are fortunate." Briggs—"How so?" Griggs—"My tailor usually calls upon me."—*Clothier and Furnisher.*

"What became of the legacy that was left to Scrivvens? Couldn't he realize on his money?" "No; he idealized on it. He spent it publishing poetry."—*Washington Star.*

She—"When lies are made from whole cloth what cloth do they use?" He—"The political canvas is the most common material, I think."—*Indianapolis Journal.*

"You don't mean to say that Crochet and Miss Uppersee are married! Why, they sang in the same choir together for over a year." "Then they ought to get along as man and wife quite comfortably."—*Boston Transcript.*

Belle—"Yes, George is nothing if not businesslike. Why, instead of proposing to me he wanted the refusal of my hand." Blanche—"How awkward, when he must know that you couldn't refuse anybody."—*New York Herald.*

Barber (to Irish customer)—"Gracious! How unanimously your hair has adjourned! Better try some of my tonic; it will bring the hair all out again." Cnstomer—"There's shmall sinse in repatin' the opyration, sor! It's out alridy, an' let it shtay out."—*Boston Journal.*

Maj. Murgatroyd—"My dear boy, pray, repress your spirits. Remember, this is a very select ball. You must not swear, laugh boisterously, or drink too much champagne." Ponsonby—"But, Major, if I behave myself like a gentleman people will take me for a waiter."—*Smith, Gray & Co's Monthly.*

The girl about entering old maidenhood never objects to a boy caught—*Pittsburg Dispatch.*

It is a good rule to pay as you go. But some men must be going very slow if they go as they pay.—*New Orelans Picayune.*

"If I were only in politics," mused the car-horse as he started up the hill, "what a lot I could do with the pull I have!"—*Baltimore American.*

Facetious Tourist—"Is it true that your canton is full of idiots?" Merry Swiss Peasant—"Yes, sir, in summer. But they don't stop long."—*Zumatt.*

Angry customer—"You told me you would have those trousers of mine to-day." Tailor—"Quite right, sir, I have them."—*Clothier and Furnisher.*

"Hullo, Gerty! You've got Fred's hat on and his overcoat." "Yes. Don't you like it?" "Well—It makes you look like a young man, you know, and that's so effeminate!"—*Punch.*

Friend—"And who is this beautiful silver service from?" Bride—"That is from Put, Assunder & Co., the celebrated divorce lawyers. They also sent their divorce circular."—*Yankee Blade.*

Watts—"I suppose that the French will now erect a bronze statue to Boulanger." Potts—"Dunno. I should think a cast-iron Gaul would perpetuate him better than bronze."—*Indianapolis Journal.*

Little Girl (reading)—"'Nature unadorned is adorned the most.' What does that mean?" Little Brother (after a deep thought)—"I guess it means a roast chicken is nicer than a chicken wif its feathers on."—*Good News.*

"O, Dear Alderman, will you help me to get into any humble position. Of course I was born and educated in America, but I couldn't help it" "Well, bedad, and the cheek of yez. There's not enough offices for onrsilves."—*Brooklyn Life.*

This is the order which a little girl brought into a Lewistown druggist's store the other day. It was written on a dirty piece of note-paper, as follows: "Mister druggist: Please send ipecac enough to throw up a four-year-old girl."

PLUMBING NOTES.

Henry A. W. Smith, a plumber of Germantown, has received the contract for fitting up the new naval and torpedo station at Newport, R. I.

While playing around a fire under the soldering kettle of plumbers at work at No. 1110 Otis street, Philadelphia, the clothing of Lizzie Edelman, aged 4 years, a daughter of John Edelman, of No. 1112 Hewson street, took fire. Her screams attracted Edward Smith, one of the plumbers, who hastened to her assistance. The child had started to run and was a blazing mass when Mr. Smith came up with her.

Having nothing at hand with which to put out the fire, he bravely took the blazing child in his arms and fought the flames with his bare hands until he had extinguished it. The child was burned almost to a crisp, and his own hands and arms are most terribly burned. The child soon died.

The Mayor presided at the last meeting of the Public Health Committee at Cork. Mr. Barry Galvin, the executive Sanitary officer, said the following portion of the report of Mr. Constantine, registered plumber, who had been recently appointed by the Water-works Committee to inspect the fittings of No. 2 Area, had been read at the meeting of that committee, and had been ordered to be brought before the Public Health Committee: "Out of a total of 118 houses inspected, I should hesitate to pronounce more than 16 or 18 to be in a fair sanitary condition, and while the authorities permit such a state of things to exist, no efforts of yours will succeed in materially reducing water waste, as the inhabitants, knowing no better, will persist in letting the water flow as the only method they knew of to keep down the horrible effluvium arising from defective fittings."

Dr. Donovan, the medical officer of health, said the report of Mr. Constantine showed the necessity for having practical plumbers as sanitary inspectors. He suggested to the Public Health Committee that the next vacancy which occurred in the staff of sub-sanitary officers should be filled by a competent plumber, whose time would be well occupied in looking after the proper construction and repair of the water-closets in a city. If this had been done earlier, a good many of the defects now found would not exist. They could not expect an outsider who was not a plumber to be able to supervise plumbing defects and get them remedied.

It was decided, after a lengthy discussion, that Dr. Donovan's suggestion should form the subject of a conference between the joint committees.

We are advised by the Stewart Ceramic Company that they expect by the middle of the month to mail to each member of the trade in this city, an elegant hanging card, richly embossed in silver and gilt, advertising their goods and deserving of a place on the wall of any plumber's store. Among the locations here, where their goods have lately gone or are to go may be mentioned the following: P. Walker, residence, 3213 Calumet avenue, L. B. Dixon, architect; residence, Jackson boulevard and Oakley avenue, M. J. Roughan, owner and plumber; H. G. McCartney, residence, Rhodes avenue, Dahlgren & Lievendahl, architects; Wm. G. Hibbard, residence, 1830 Calumet avenue, P. Nacey, plumber; H. Byrne, residence, 3519 Wabash avenue, owner and plumber; Geo. R. Wentworth, residence, Fifty-first street, near Champlain avenue, C. V. Arnold, architect; M. J. Roughan, 517-19 W. Congress street, owner and plumber; S. M. Fischer, residence, Drexel boulevard, near Fifty-first street, Charles S. Frost, architect. The company now has its new catalogue in press, which, when completed, promises to be the finest specimen of the printer's art and handiwork yet issued along that line, it will also be printed in colors. Address all inquiries to the Stewart Ceramic Co., 323-5 Dearborn street, and 60-2 Plymouth place, this city.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERAIL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

Armitage ave. and Mozart street, H. Breyer, Jr., 1706 Milwaukee ave.

5144 Atlantic street, J. B. Sheville, 5032 State street.

3153 Broad street, Sherman & Bennett, 2515 S. Halsted street.
5353 Butterfield street, J. B. Sheville, 5032 State street.
8736 Buffalo street, Webster, Crombie & Henderson, 9243 Commercial ave.
Commercial ave. and Wilson street, A Kelly, 25 E. Washington street.
Canal and Taylor streets, Morris Bros., 3442 S. Halsted street.
Chicago ave. and Wesson street, E. Sheehan, 222 Illinois street.
Dunning and Racine aves., H. Bauer, 232 E. North ave.
4849 Dearborn street, J. B. Sheville, 5032 State street.
Dearborn street, S. of 53d st., J. B. Sheville, 5032 State street.
Duncan ave. and 83d street., Webster, Crombie & Henderson, 9243 Commercial ave.
Division and Rumsey streets, J. Walsh, 3613 Ellis ave.
345 Erie ave., Harvy & Mose, 665 North ave.
9 Evans ave., C. Kostlevy, 218 W. 18th street.
9248 Erie ave., Webster, Crombie & Henderson, 9243 Commercial ave.
48th Pl. and Oakley ave., O. Heyman, 300 Washburn ave.
621 Fairfield ave., Steiner & McFarlane, 918 W. 21st street.
712 Fullerton ave., F. Gruschow & Co., 84 Oak street.
261 Fremont street, J. G. Roland, 952 N. Halsted street.
Fairfield and 16th streets, C. Kostlevy, 218 W. 18th street.
50th street near Halsted, J. B. Sheville, 5032 State street.
Fillmore and Sacramento aves., W. H. Cummins, 1236 W. Van Buren street.
Fairview and Diversey aves., Harvy & Mose, 665 North ave.
339 Hastings street, O. Heyman, 300 Washburn ave.
6620 Honore street, Dewar & Co., 6312 Wentworth ave.
9034 Houston ave., Webster, Crombie & Henderson, 9243 Commercial ave.
14 Hirsch street, Nelson & Cedarholm, 87 W. Ohio street.
224-26 Humboldt ave., Nelson & Cedarholm, 87 W. Ohio street.
Halsted and Roscoe, H. Bauer, 232 E. North ave.
469 Jackson, Hamblin & Co., 348 S. Robey street.
1349 Jackson street, W. H. Cummins, 1236 W. Van Buren street.
1382 Jackson street, W. H. Cummins, 1236 W. Van Buren street.
Kedzie ave. and 25th street, C. Kostlevy, 218 W. 18th street.
Kedzie ave., S. of 12th street, C. Kostlevy, 218 W. 18th street.
1333 Lill ave., H. Bauer, 232 E. North ave.
43 45 Warren ave., Steiner & McFarlane, 918 W. 21st street.
Myrtle and Woodlawn aves. F. J. Fischer, 7446 Cottage Grove ave.
5623-25 Mich. ave., Nash & Harna, 2216 Wabash ave.
8506 Mackinaw street, Webster, Crombie & Henderson, 9243 Commercial ave.
515 North ave., J. T. Bunting, 477 W. North ave.
1201 North ave., J. G. Geiss, 161 Southport ave.
203 North ave., C. Kleutz, 352 Elston ave.
1252 Ohio street, Harvy & Mose, 665 North ave.
64 Osgood street, J. Lenz, 357 Larrabee street.
Palmer ave., J. T. Bunting, 477 W. North ave.
69 Pleasant Pl., J. T. Bunting, 477 W. North ave.
369 Paulina street, J. Wilkie, 262 Ogden ave.
314 Polk street, W. H. Cummins, 1236 W. Van Buren street.
Richmond and Augusta streets, Harvy & Mose, 665 North ave.
Robey and 50th streets, C. Kostlevy, 218 W. 18th street.
Robey and 49th streets, C. Kostlevy, 218 W. 18th street.
712 Rockwell street, Harvy & Mose, 665 North ave.
75th street and Dobson ave., D. Walsh, 6758 S. Chicago ave.
77th street and Greenwood ave., J. Bell, 79 35th street.
34th street and Laurel ave., Steiner & McFarlane, 918 W. 21st street.
Troy street, S. of 22d street, C. Kostlevy, 218 W. 18th street.
24 Temple street, Nelson & Cedarholm, 87 W. Ohio street.
3556 Vermont ave., C. Walter, 403 Blue Island ave.
3819 Vincennes ave., J. H. Roche, 210 31st street.
Western ave., S. of 19th street, Steiner & McFarlane, 918 W. 21st street.
626 Wellington street, P. H. McCabe, 1715 N. Ashland ave.
5630 Wharton ave., Kuhn Bros., 4111 State street.
4250 Wentworth ave., A. Miller, 4300 Wentworth ave.
912 Warren ave., J. J. Hamblin & Co., 348 S. Robey street.
345 Warren ave., W. H. Cummins, 1236 W. Van Buren.
5127 Wabash ave., E. Hennessey, 3247 State street.

THE GORTON SOFT COAL BOILER.

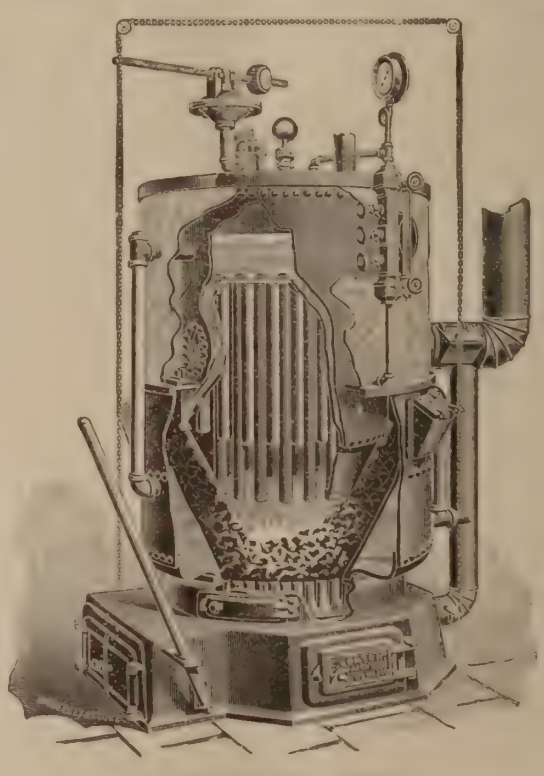
At last a form of house heating boiler seems to have been obtained in which soft coal can be used for fuel satisfactorily. We refer to the Gorton Soft Coal Boiler, manufactured exclusively by the Gorton & Lidgerwood Company, of New York, Chicago and Boston, and illustrated in the engraving on this page. It is the invention of Mr. Charles Gorton, of Brooklyn, N. Y., and in design is unlike any other soft coal boiler now upon the market. The very satisfactory results obtained from a number of trials and tests made by the manufacturers, lead those who have witnessed its performance to believe it the long-looked for boiler for burning successfully the soft coal which is so abundant in the South and West, but which from its tendency to deposit unconsumed carbon or soot upon the heating surface of the boiler in which it is used, has given much trouble, and, indeed, has rendered its use far from being economical in spite of the cheapness of such fuel.

A number of styles of soft coal burning boilers have heretofore been devised and used with more or less satisfactory results, but the construction of none of them can be said to have entirely compassed the troublesome soot question.

The thick black smoke which causes the deposit of soot on the heating surface of the boiler is given off when the coal begins to burn or coke, and ceases when that part of the combustion is perfect.

The construction of the Fire Pot of the Gorton Soft Coal Boiler is such that perfect combustion is maintained by admitting sufficient additional air through the fingered ring above the surface of the grate, between the Fire Pot and the Coking Chamber, and igniting all the gases arising from the coking process, thus preventing the deposit of soot on the heating surface of the boiler and making effectual that part of the fuel which is generally wasted when soft coal is burned in all ordinary Fire Pots.

The construction of the boiler, which can be readily understood by reference to the illustration, is such that it generates



(GORTON SOFT COAL BOILER.)

steam in the most economical and effectual manner, as the gases come in contact with the tubes and inside of the shell at the highest temperature, and cooling, pass through the opening in front of the boiler and around the shell before going out the smoke pipe at the rear. The boiler proper is surrounded by a non-conducting jacket of galvanized iron, lined with asbestos sheeting, thus confining the heat generated to its proper channel and preventing radiation. The main or tubular part of the boiler is directly over the fire. The water-leg or lower part surrounds the fire and is connected to the boiler above by suitable circulation pipes. The Coking Chamber Coal Reservoir, which is annular, is between the

lower outer surface of the boiler and the upper part of the water-leg, and will hold enough coal to last from twelve to twenty-four hours.

The position of the Coal Pockets is such, that the Reservoir is as easily filled as an ordinary kitchen range. The fingered ring which surrounds the grate allows the air to pass through the fire, thus keeping up a sharp fire long after the grate is covered with ashes. The grate which is of an improved form is furnished with an upright lever attachment for shaking, which does away with any necessity of stooping and is a very convenient arrangement. The boiler throughout is made with great care.

The Gorton & Lidgerwood Company invite correspondence and will cheerfully furnish any further information desired upon application to their New York headquarters, 96 Liberty street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Treat & Foltz have completed plans for an 8-story warehouse, 50x200, for the Lake Shore & Michigan Southern railroad, to be built at Pacific avenue and Twelfth street. It will be constructed of brick and stone, on a steel frame. It will be heated by steam and supplied with elevators; cost, $135,000. W. L. B. Jenney and W. B. Mundil have completed plans for a 3-story residence, 30x75, for John Lynch, to be built at State street and Burton place. It will be built of granite with hardwood interior finish and will be heated by hot water; cost, $60,000. S. S. Beman has completed plans for a 2-story laundry, 70x154, for the Pullman Palace Car Company, to be built at Pullman, Ill. Brick and stone construction; cost, $50,000. F. W. Perkins has designed an entirely new interior for F. S. Osborn's house at the northeast corner of Grand boulevard and Forty-ninth street; cost, $50,000. For B. Philpot & Co., he has designed a 4-story and cellar store and flat building, 50x90, to be erected at 1250 and 1252 Michigan avenue. It will be constructed of pressed brick, stone and terra cotta; cost, $40,000. For J. M. Bishop he has planned a 4-story and basement store and flat building, 27x85, to be built at 1256 Michigan avenue; brick and stone construction; cost, $25,000. Also for the Philpots a 4-story store and flat building to be erected at 1464 Michigan avenue; cost, $20,000. For James Barrell a new interior for his residence at 2918 Michigan avenue; cost, $20,000. For A. H. Adams at Oak Park, a 2-story attic and basement residence, 30x40; cost $4,000. For L. Everingham he has planned ten grain warehouses to be built in Iowa, at a cost of $10,000. Clinton J. Warren has planned a 3-story dwelling, 35x100, for John Cooper, to be built at 2733 Michigan avenue. It will be of stone with elaborate hardwood interior and will be heated by hot water; cost, $25,000. Huehl & Schmid are planning a slaughter and packing-house, to be built at Fort Madison, Ia., by a firm of Chicago packers. The main building will be three stories, 100x164, with several smaller structures, constructed of stone and brick, and will cost $80,000. For C. M. Jones they have designed a 4-story store and flat building, 39x64, to be built on Clark street, near Livessey avenue, brick and stone construction; cost, $16,000, For S. Meyer they have designed a 2-story and attic residence, 63x40, to be built on Evanston avenue, near Halsted street; cost, $9,000. For Charles G. Muller they have designed a 3-story residence, 25x66, to be built on Serf street, near Waubun avenue, constructed of brown-stone with hardwood interior; cost $10,000. Julius Speyer has completed plans for a 3-story and basement pavilion, 48x80, to be erected on West Madison street, near Garfield Racing Park by A. Pfaff; it will be built of stone and brick, and will contain saloon and restaurant with flats above; cost, $20,000. For M. W. Ryan he has designed a 4-story and basement store and flat building, 84x70, to be erected on 55th street, near Jefferson avenue; it will be constructed of brick and stone; cost, $40,000. For Peter Birk he has planned a 4-story flat building, 50x80, to be built on Kimbork avenue, between 55th and 56th streets; cost, $20,000. Snyder & Nothnagel have planned a 4-story store and flat building, 38x90, to be built on Cottage Grove avenue, between 45th and 46th streets; it will be of stone with metal bays; cost, $18,000. They have also planned for Henry Carter a 3-story flat building, 22x54, to be built at 281 Center avenue; cost, $8,000. Park & Pursell have designed a 2-story, attic and basement residence for G. W. Pierce, to be built on the east side of Grand boulevard, near 48th street; it will be constructed of stone with hardwood interior, and will be heated by hot water; cost, $18,000. They have also planned for Mrs. Atkinson a 2-story flat building, 25x70, to be built on Whipple street, near Jackson; pressed brick construction; cost, $4,500. Furst & Rudolph have completed plans for a 4-story store and flat building, 50x127, for D. M. McKindley, to be built at 2317-19 Wabash avenue; it will be constructed of pressed brick and stone; cost, $50,000. J. L. Silsbee has designed a 3-story apartment house for J. S. Norton, to be built at the corner of Lill and Lincoln avenues; pressed brick and stone construction; cost, $40,000.——Cincinnati, O.: Architect J. W. McLaughlin has plans for a German old men's home, to be three stories, built of common and pressed brick, stone foundations and trimmings; cost, $90,000. Architect S. Hannaford has plans for a residence for J. E. Hancock, to be built of pressed brick, stone foundation and trimmings; cost, $45,000. Architects Crapsey & Brown have plans for a chapel building for Center College, Danville, Ky., to be 60x130, three stories, built of pressed brick, stone foundations and trimmings; cost, $23,000. They have also plans for a school-house for the School Board of Danville, Ky., to be three stories, built of common brick, stone foundations and trimmings; cost, $15,000. Architects Plympton & Nash have plans for a residence for Mrs. J. S. Cook, Myrtle avenue, Walnut Hills, to be two and a half stories, built of pressed brick, stone foundation and trimmings; cost, $10,000. The same architects have plans for remodeling a residence for R. T. Miller, Covington, Ky., at a cost of about $5,000. Architect J. H. Boll has plans for a residence for Mrs. Rose Bussing, Myrtle avenue, Walnut Hills, to be built of pressed brick, with stone foundation and trimmings; cost, $4,500.——Atlanta, Ga.: Bruce & Morgan have prepared plans for a court-house to be erected on the Public Square, to be 60x90, common pressed and ornamental brick, granite and marble, stone foundation and trimmings; cost, $20,000. The same architects have prepared plans for an 8-story hotel for A. C. Collier. They have also prepared plans for a court-house at Rome, Ga.——Beaumont, Tex.: Eugene T. Heiner. of Houston, is preparing plans for a court-house to cost $35,000.——Richmond, Va.: Albert L. West is preparing plans for a 1-story addition to be made dormitory building of the State Penitentiary, 25x500, brick; cost, $32,500.——Milwaukee, Wis.: Architects Ferry & Clas have plans for a double dwelling for J. J. Schissler. To be 48x54, 2-story, built of common brick, frame, stone trimmings; cost, $6,000. Architects Crane & Barkhauser have plans for a residence to be erected corner of 32d and Wells streets for Geo. J. Schuster. To be 60x90, 3-story, built of common, pressed and ornamental brick, granite, stone foundation and trimmings; cost, $30,000. Architect B. Kolpacki has plans for a store and residence to be erected on Sixth avenue for Henry Radamaker, 633 Fourth avenue. To be 45x75, 3-story, built of brick, with stone foundation and trimmings; cost, $6,000. The same architect has plans for a store building and residence, to be erected corner of Sixth avenue and Mitchell street, for Stephen Stemper. To be 45x75, 3-story, built of brick, with stone foundation and trimmings; cost, $6,000.

HEATING AND LIGHTING.

Peabody, Mass.: An appropriation of $47,000 has been made to establish a plant with 120 arc lights. Work will be commenced shortly.——Hammondsport, N. Y.: The Bath & Hammondsport R. R. Co. will put in a Thomson-Houston plant for lighting its premises and the village.——Latrobe, Pa.: The electric light company has been awarded a contract for lighting the streets with 28 arc lights of 2,000 c. p. at $75 per light per annum for the first 25 and $70 for all above that number.——Johnstown, Pa.: The electric light company has been awarded a five years' contract for 146 arc lights at $108 per light per annum.——The following electric light companies have recently been incorporated: Attica Electric Light & Power Co., of Attica, N. Y.; A. Krauss, E. B. Wallis and Lewis Benedict, $20,000; Cornwall Electric Lighting & Power Co., of Cornwall, N. Y., T. Taft, S. B. Young and H. W. Chadeayre, $15,000.——Elberton, Ga.: $40,000 has been voted for electric light plant.——Pascoag, R. I.: $10,000 is to be expended on an electric lighting plant. Address H. Smith for details.——Lander, Wyo.: The Lander Electric Light & Power Co. has been incorporated by

John D. Woodruff, Eugene Amoretti and others; capital stock, $10,000.——Enterprise, Miss.: An electric lighting plant is to be established at this place by the Enterprise Manufacturing and Development Company.——Brenham, Tex.: This place is to have electric lights. Address William Axet for particulars.——Rochester, N. Y.: It has been announced that the public lighting contract in this city will expire July 1, 1892.——Creston, Ia.: A new electric light company has been organized at this place.——Ridgefield, Conn.: A stock company has been formed here which will soon erect a plant for incandescent electric lighting. Upwards of a thousand lights have already been subscribed for, including 100 for street lighting purposes. Clarence Mead is obtaining estimates, etc.——St. Paul, Minn.: The Board of Managers of the reformatory at St. Cloud, Minn., have awarded the contract for electric lighting to the Edison company, at $1,285, the incandescent lamps to be supplied at 40 cents each. The next lowest bid was $1,785 for the plant and 60 cents for the lamps. Another company bid $1,950 for the plant and 60 cents for the lamps. The contract calls for 295 incandescent lamps.——St. Thomas, Ont.: The St. Thomas Edison Electric Company has been organized here, with a capital stock of $25,000, to establish an incandescent plant. Judge Hughes, G. R. Rennington, Frank Hunt and others, are interested.——Utica, N. Y.: The Utica Electric Light Company will increase the capacity of its plant by the addition of an engine of 1,000 horsepower.——Franklin, Ky.: For important information regarding the projected electric light plant at this place, address S. M. Harris as above.——West Newton, Pa.: The West Newton Electric Light and Power Company will expend about $55,000 on an electric light plant.——Irvington, Ind.: The question of a public gas lighting system is being discussed by the local officials.——Philadelphin, Pa.: Director Windrim has asked for the sum of $300,000 for the purpose of making extensions, etc., to the lighting system of this city.

SEWERAGE NOTES.

Fairfield, Me.: The question of sewerage is under discussion. The cost is estimated at $40,000.——Summerville, Ga.: Mr. Wm. Kiersted, of Kansas City, Mo., will prepare plans for sewerage.——Macon, Ga.: A bill has been introduced to authorize the issue of $210,000 sewerage bonds.——Colorado Springs, Col.: The sewer system is to be extended 12 blocks, at a cost of about $12,000.——Denver, Col.: A sewage utilization company is being organized.——Tunkhannock, Pa.: The question of sewerage in this town, at present, is merely presumptive; there have been no steps taken up to the present time.——Meriden, Conn.: The Common Council has appropriated $10,000 to cover the cost of preparing complete maps and plans of the proposed new sewer system, and the special sewer committee has been authorized to purchase 100 acres of land for the irrigation field.——Westfield, Mass.: A sewerage appropriation has been made at this place.——Olympia, Wash.: No definite steps have been taken as yet regarding sewers.——Waltham, Mass.: Bonds in the sum of $50,000 are to be issued for sewerage purposes at this place.——McKeesport, Pa.: Ordinances favoring the construction of numerous additional sewers have passed the Borough Council. Address Councilman Wilson for particulars.——Berkeley, Cal.: It is proposed to construct a system of sewers in South Berkeley. For particulars address Town Engineer King, as above.——Middletown, N. Y.: A main sewer is to be constructed on Monhagen ave., this city. For particulars address President Decker, of the Board of Aldermen, as above.——Woonsocket, R. I.: The sewerage matter is in the hands of a special committee of the City Council, the Mayor being chairman. A report of the committee's work is expected to be made soon to the City Council. The necessary legislation to obtain land, etc., has been gotten, and when report is made it only remains for City Council to vote the improvement made.——Birmingham, Ala.: The Mayor can give information as to a complete system of sewerage, for which the City Engineer has been directed to prepare plans.——Kansas City, Mo.: Sewerage improvemonts, to cost $50,000, are being considered here. For particulars address Dr. R. P. Waring, as above.——Medina, N. Y.: A sewerage movement has been started at this place.——Minneapolis, Minn.: The assessment rolls for public improvements for next year include $294,233 for sewers.——South Berkeley, Cal.: The town trustees, the town engineer and the citizens of this place are to have a conference to determine upon a satisfactory system of sewerage for that locality.——Lansingburg, N. Y.: It has been decided to expend about $70,000 for additional sewers.——New London, Conn.: A committee has been appointed to estimate the cost and get information as to various preliminaries to the extension of the intercepting sewer up the valley from West Coit street to Lincoln ave., and make report at an early date.——Los Gatos, Cal., will vote upon the question of issuing bonds for $40,000 for sewerage and other municipal works.——Quincy, Mass.: The sewerage act has been voted down.——Manchester, Va.: The finance committee has recommended issuing $75,000 in bonds for the construction of sewers.——Denver, Col.: The Board of Public Works has accepted the North Denver sanitary sewer.

WATER WORKS NOTES

Taunton, Mass.: An appropriation of $28,000 has been made for new mains and 4 per cent. 20 year bonds ordered issued.——Stockbridge, Mass.: There is talk of a new supply to be introduced by the company or the town. Surveys are being made from Lake Averic, 4 or 5 miles distant.——Colfax, Wash.: Bonds for works to the amount of $50,000 have been voted ——Milton, Ore.: $10,000 has been voted for water works extensions and an electric light plant.——Cape Girardeau, Mo.: It is reported that the city will build works.——Warrensburg, Mo.: Works have been defeated by a vote of 321 to 66.——Batesville, Ark.: Address J. C. Yancey for information regarding proposed works.——Stuttgart, Ark.: It is reported that a company desires to build works.——Platonia, Tex.: Arrangements for the construction of works are reported as under way.——Hartland, Tex.: Water has been found, and it is reported that works will now be put in.——Rockdale, Tex.: The Rockdale Improvement Co. was incorporated Sept. 25; capital stock, $25,000.——Squirrel Island, Me.: It is reported that works will be built next spring.——Ithaca, Mich.: At a special election $25,000 in bonds was voted for works.——Romeo, Mich.: B. N. Seaman, Clerk, has sent the following: Two pumps and two boilers, with combined capacity of 1,440,000 galls. are wanted; also about 6 miles 10 to 4-in. pipe, specials, valves and 40 double hydrants.——Saginaw, Mich.: J. D. Cook, Toledo, has reported in favor of building settling reservoirs near the present East Side works, to be supplied from Cass River. The West Side works would be retained for emergency use.——St. Joseph, Mich.: It is reported that a vote will be taken on issuing $50,000 of bonds for works.——South Haven, Mich.: Bonds to the amount of $35,000 have been voted for works.——Warrensburg, Mo.: The water works proposition has been voted down.——Pulaski, Va.: The Pulaski Light & Water Co. was incorporated Sept. 26; capital stock, $250,000.——Perry, Ga.: Authority has been secured to issue bonds for works. The supply will probably be from an artesian well.——Washington, Ga.: Contracts have been closed for an artesian well for works.——Gainesville, Fla.: It is reported that Hartford, Hebert & Co., Chattanooga, have received the contract to build works here.——Newbern, Tenn: Address J. I. Jones, secretary Water Committee, regarding bids for city works. Bonds have been voted.——Ridgedale, Tenn.: A water company is talked of.——Hustonville, Ky.: Works are projected.——Pineville, Ky.: The Pineville Water Co. has been reorganized with an increased capital stock.——Santa Barbara, Cal.: The Mountain Water Co. was incorporated Sept. 28; capital stock, $100,000. It is proposed to tunnel into the mountain for water to supply the city. H. W. Moore and E. S. Sheffield are interested.——Edison, Wash.: Chief Lillis has submitted an estimate showing that the water works system projected for this place will cost $3,000. Bids will soon be wanted.——Rockdale, Tex.: The Rockdale Improvement Co. is about to expend the sum of $25,000 on building a water works system. Address J. C. Gorman for particulars.——Rock Hill, S. C.: Plans, specifications, etc., are wanted at once for a water works system for this place. Address W. B. Wilson, Jr., for particulars.——Ridgedale, Tenn.: Efforts are being made to establish a system of water works at this place.——Chehalis, Wash.: A company of Seattle capitalists have made a proposition to the City Council for a water works franchise. If accepted, they will invest $50,000 in a plant at once.——Batesville, Ark.: It is said that work is to commence at once on the projected water works system for this place. Address J. C. Yancey for details.——Princeton, Ky.: The Mayor of this city can furnish important information regarding a water works project.——Carolton, Ga.: A bill has passed the legislature authorizing the issue of $25,000 bonds for a water works system.——Walden, N. Y.: Water works have been voted here.——East Saugus, Mass.: The question of making an additional appropriation for the town's water supply system will be considered.

BIDS AND CONTRACTS.

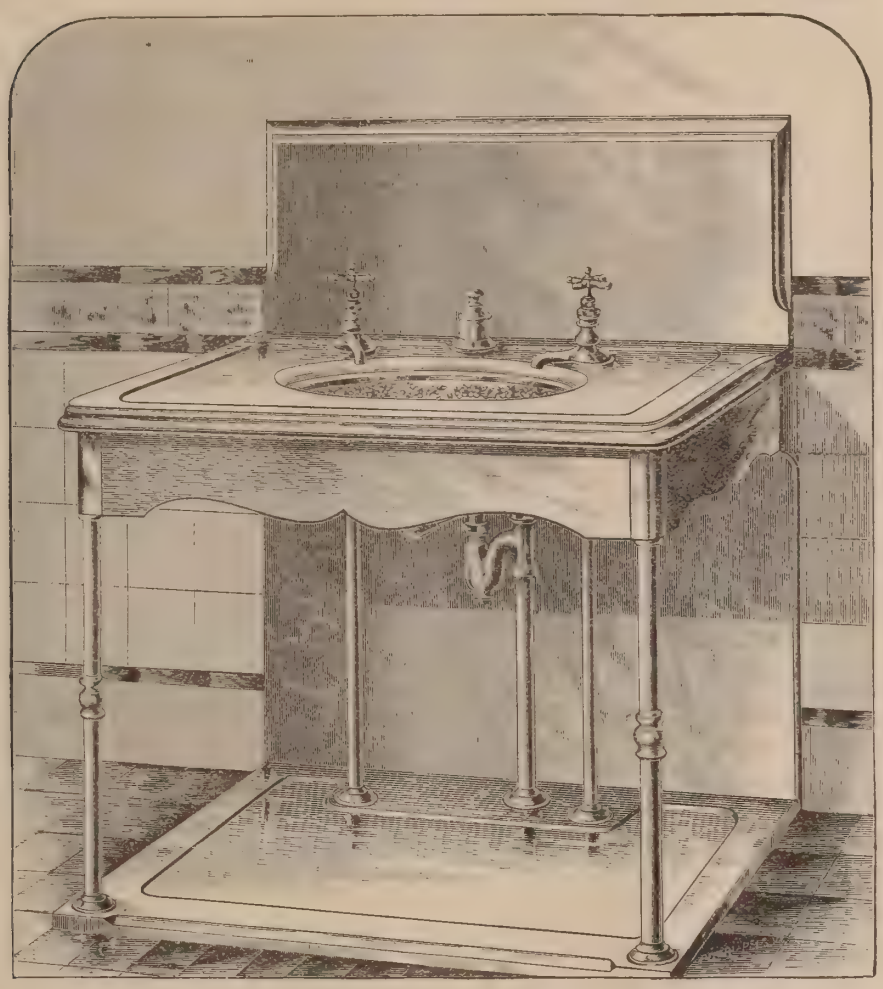
Tekoa, Wash.: Proposals are wanted until November 1, for the construction of a system of water-works. Address Town Clerk C. F. Lake for particulars.——Boston, Mass.: Bids for building sections 21 and 22 of the sewer system in Medford, and 24 in Everett and Charlestown will be received until November 4, by the Board of Metropolitan Sewerage Commissioners.——Missoula, Mont.: Bids for sewer construction on certain streets open until October 26.——Cleveland, O.: Bids for street electric lighting for one year from January, 1892, will be received until November 4——Cairo, Ill.: Proposals will be received by the supervising architect at Washington, D. C., until October 26, for the labor and materials for removing the old heating apparatus and replacing it by a new steam heating apparatus in the United States Custom House building.

NEW TRAIN ON THE WABASH ROAD.

Taking effect October 11th, the Wabash Road will put into service from Chicago to St. Louis and the West, an additional train leaving Chicago at 11:35 P. M. daily. This train will have through sleeping cars for Peoria, Springfield, Jacksonville and St. Louis.

The 9:20 P. M. fast train for St. Louis will continue to run as usual, carrying the popular compartment sleeping cars, free chair cars, etc.

No. 5.



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Graceland Cemetery Co., 2-sty and bst frm dwlg, 28x47; a, Holabird & Roche	6,000
J. S. Norton, 5 3-sty and 4 3-sty and bst brk strs and flts, 90x48, 90x43, 450-56 Lincoln ave. and 1511-23 Lill ave	35,000
G. Schwarz, 3 sty and bst brk dwlg, 34x87, 325 Lincoln Pl	12,000
W. L. B. Jenney, 2-sty and bst brk dwlg, 52x48, 1668 Bittersweet Pl	11,000
N. B. Mundie, 2-sty and bst brk dwlg, 37x56, 27 Gordon Terrace	8,000
Geo. E. Kaesel, 4-sty and bst brk flts, 23x67, 1808 Frederick st	15,000
Geo. Beaumont, 3-sty and bst brk flts, 25x68, 1509 Wellington st	7,000
W. Wilson, 3-sty and bst brk flts, 62x45, 1430-32 Dunning st; a, L. Martin	12,000
Geo. R. Allen, 4 2-sty frm dwlgs, 20x32, 1035-37 and 1049-51 Wolfram st	5,000
Albert Mandel, 2 3-sty and 2-sty and bst brk dwlgs, 50x74, 3924-26, Grand Bld; a, Wilson & Marble	25,000
A. Lund, 3-sty and bst brk flts 22x72, 271 W. Huron st	7,000
L. G. Hallberg, 2 3-sty and bst brk dwlgs, 40x75, 405-07 E. Huron st; a, L. G. Hailberg	20,000
Jno. Mountain, 2 3-sty bst brk dwlgs, 40x75, 409-11 E. Huron st; a, L. G. Hallberg	20,000
M. F. Kellogg, 3-sty and bst brk flts, 23x62, 36 Oak ave	6,000
G. W. Davis, 4-sty and brk flts, 33x64, 69 33d st; a, E. H. Turnecke	10,000
Peter Guthrie, 3-sty brk brn, 46x70, 78-80 Kramer st	5,000
Robt. Gordon, 2 3-sty and bst brk strs and flts, 26x68, 4828-30 State st	5,000
L. T. Reagan, 2 2-sty and bst brk flts, 40x66, 611-13 66th st	8,000
F. F. Aulman, 2 2-sty and bst brk strs and flts, 62x34, 6322-24 Aberdeen st	5,000
Jno. Tarbason, 8 2-sty and bst brk flts, 250x50, 5416-26 and 5421-27 Dearborn st	30,000
E. L. Zarlott, 4 2-sty and bst brk flts, 96x52, 72d st, nr Perry ave	20,000
Christ Gudryhon, 3-sty and bst brk str and flts, 25x83, 934 63d st	15,000
E. Brown, 4 2-sty and cel brk flts, 26x44, 5639-45 Morgan st	18,000
Jas. Brin, 3 3-sty and bst brk strs and flts, 75x-78, 5900-04 Halsted st	20,000
Jas. Battel, 2-sty and bst brk flts, 21x72, 5927 La Salle st	5,400
S. S. Beman, 2 2-sty and bst frm dwlgs, 30x25, 6105-09 S. Park ct	6,700
Edward Mandel, 4 3-sty and 2 sty and bst brk dwlgs, 60x74, 4235-39 Michigan ave	35,000
G. P. Hammner, 3-sty and bst brk flts, 25x60, 6224 Madison ave	8,000
S. M. Fischer, 3 and 2-sty and bst brk dwlg and brn, 82x40, 5016 Drexel Bld; a, C. S. Frost	25,000
Calumet Turners, 3-sty and bst brk hall, 764-129, 9202-16 S. Chicago ave; a, Diethelm & Ray	30,000
A. S. Hall, 2-sty and bst frm dwlg, 28x56, 5535 Washington ave	7,000

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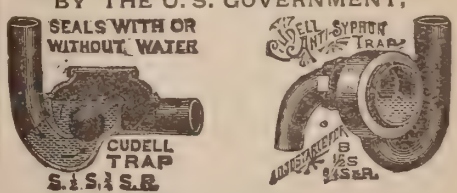

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Trap Ventilation not Shown.

A. Sewer.

A-C. DRAIN; the portion between the sewer and the running trap, **B**, is called the "sewer connection."

B. RUNNING TRAP.

B-K. AIR-INLET PIPE, for foot ventilation.

C. SOILPIPE ELBOW, with hand-hole for cleaning out, closed by screw plug. The drain must have a regular fall, or grade, and this elbow provides for that.

C-D. Rain water LEADER (conductor); not necessarily part of the Durham System.

E and **G.** Y BRANCH, close-nipple and 45° ELBOW; connecting drain and vertical pipe. Serving same purpose as **C**.

E-F. SOILPIPE, 3, 4, 5, or 6 inches in diameter; pipes draining water-closets are called "soil-pipes." those draining other fixtures "waste-pipes."

F and **H.** ROOF CONNECTIONS.

G-H. WASTEPIPE, 2 or 3 inches diameter; enlarged at upper end to prevent freezing in very cold climates.

K. AIR-INLET BOX.

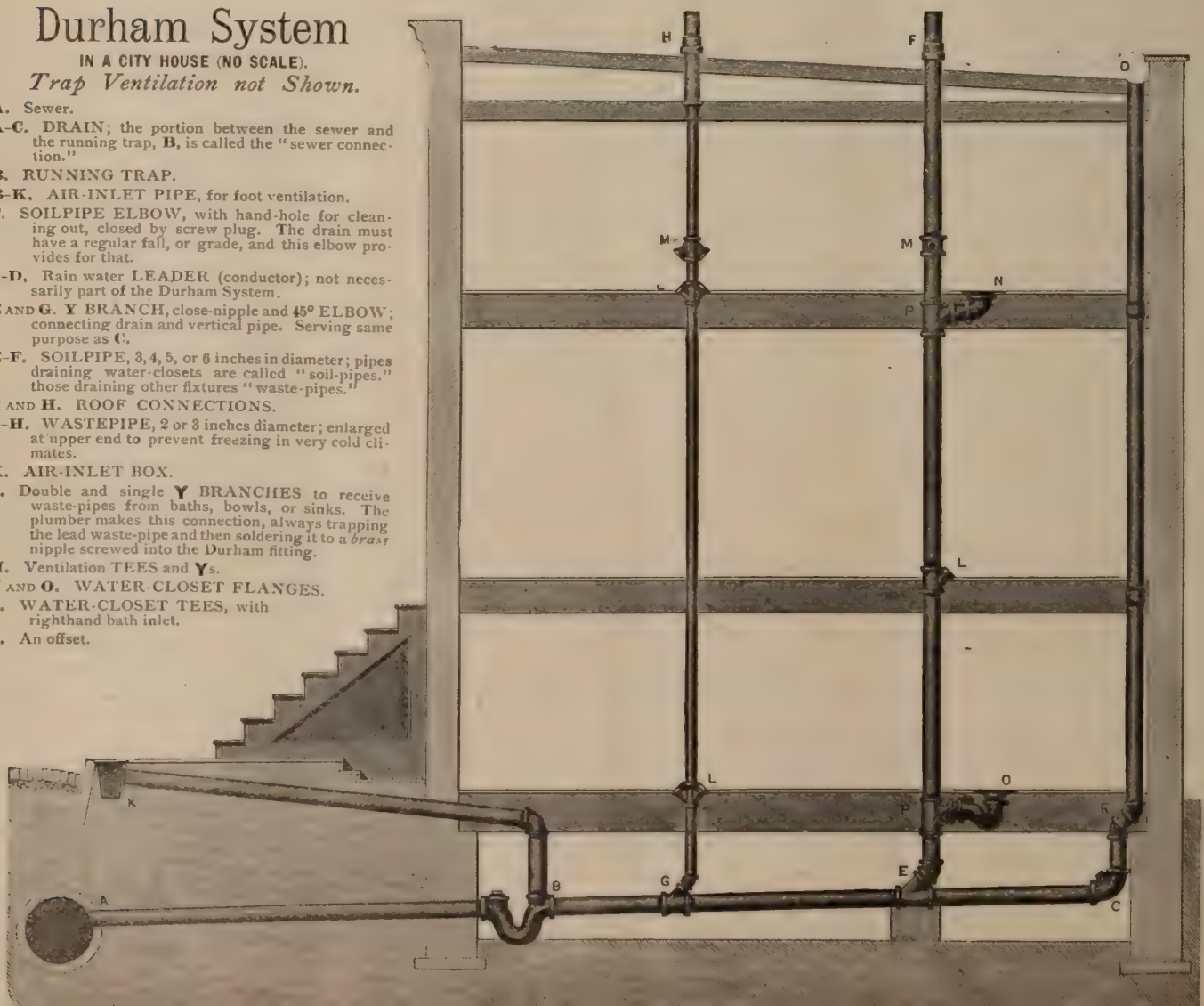
L. Double and single Y BRANCHES to receive waste-pipes from baths, bowls, or sinks. The plumber makes this connection, always trapping the lead waste-pipe and then soldering it to a *brass* nipple screwed into the Durham fitting.

M. Ventilation TEES and Ys.

N and **O.** WATER-CLOSET FLANGES.

P. WATER-CLOSET TEES, with righthand bath inlet.

R. An offset.



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THE New York *Herald* closes an editorial on the importance of isolating the victims of contagious diseases long enough to prevent the spread of disease among school children with the remark that "a creditable examination in school hygiene should be an indispensable condition of any person's appointment to the position of teacher." The *Herald* is right. The important matter of health should never be ignored, least of all in the school room.

* * *

DR. EDSON, of the New York Board of Health, adds another to the many strong points made in favor of vaccination. He says: "During over nine years' service in the health department of New York I have never seen a case of small-pox in a person who had been successfully vaccinated within five years, and the number of cases I have seen mount into the hundreds. During that period I have seen only one inspector of contagious diseases contract small-pox, and he was the only inspector who disbelieved in vaccination, and refused to have it performed on himself."

* * *

THE Philadelphia Board of Health has instituted an inquiry into the sale of the milk of tuberculous cows in that city. This action, following the startling reports of health authorities elsewhere calls renewed attention to the public danger from the consumption of milk obtained from affected animals. The Philadelphia investigation has been begun since the receipt of the report of the committee instructed by the Veterinary Department of the University of Pennsylvania to test the value of Dr. Koch's tuberculin by experiments upon cows. This committee has been at work for some months and now reports, while the tuberculin has no value as a curative agency, it is of great worth in detecting the presence of tuberculosis in the animals. Such a use is by no means unimportant, for in its early stages the disease is very difficult to discover, and it is of course of vital importance that the milk and flesh of affected cattle be kept from public sale. There is apparently great need in Philadelphia and elsewhere for the strictest supervision of the public milk supply, and if the Koch remedy proves of no avail except to detect consumption in cows it will yet be of great public value.

* * *

IN the death of President Joseph A. Macdonald, the National Association of Master Plumbers lose one of their brightest and best men. He had started out upon the duties of his office with a clear understanding of what they were, and with a determination to discharge them. Had he lived to carry out his designs, the National Association would have been the gainer, and all its members would have felt his guidance.

* * *

"MORTALITY in Relation to Occupation," a paper read at the late congress on hygiene and demography, by Dr. Wm. Ogle does not seem to waste much time on the dust of the occupation of carpenters and joiners. The dust from the ordinary woods used by such men does not seem to have any very baneful effect upon the air passages, for the mortality of these workmen, both from phthisis and other diseases of the lungs average lower for males generally. "The harder kinds of wood, however, such as are used by cabinet-makers, are said to give off a much more injurious dust than do the softer woods used by the carpenters; and that this is so is not only probably *a priori*, but is supported by such scanty statistical evidence as I can adduce. For though I am unable to give the mortality of cabinet-makers from phthisis and respiratory diseases by themselves, their mortality from all causes together is considerably higher than that of carpenters, the mortality figure in Table A for those latter 148, while that of cabinet-makers and men generally in the upholstering business is 173."

* * *

THE American Institute of Architects will hold its annual meeting in Boston on October 28, 29 and 30. The Boston Society of Architects, the Boston Architectural Club and the New York Architectural League will add to the interest of the meeting by an exhibition to which architects and draughtsmen have been asked to contribute. The headquarters of the Institute will be at the Copley Square hotel, and the convention itself will be held in a hall fitted up for it in the public library building.

NATIONAL PROTECTION.

We find a good article on the subject of Protection in the last issue of the *Sanitary Plumber*. If the work gets put down in accordance with this, it will be on the basis where it belongs, and being printed in the city of Joseph A. Macdonald, the national president of the plumbers, it would seem that he knows what is being said regarding it.

We commented in our last issue, in speaking of the work of the National Association, on the efforts that are being made to render trade protection something more than a mere empty phrase, a mirage with which the over hopeful plumber deludes himself and imagines that he terrorizes the supply houses. There has hardly been a trade contest of any magnitude that has not served to prove that the protection agreement was the veriest house of cards, while in many cases, where absolutely no agreement existed, it was supposed that the Baltimore Resolutions covered the entire question and could be enforced from headquarters instantaneously at the call of a local organization.

It would be just as sensible to hope for the creation of a substantial building from materials of recognized worthlessness, as to suppose that the National Association of Master Plumbers is capable of doing effective work with the aid of an aggregation of weak local societies. The first requisite in an effective system of national protection is local efficiency; the minor associations must learn to protect themselves before they can expect the central body to protect them. What applies to the strength of the one is equally applicable to the power of the other, as we may readily prove. We have scattered throughout the country a large number of local organizations, each the counterpart of its neighbor. They comprise a few of the leading men in the trade in the locality, but there are probably as many plumbers out of the ranks as in them. There may be an agreement in force with local supply houses, but it applies only to members, and the non-members are numerically and financially strong enough to exercise considerable influence with the dealers. Under such circumstances the latter in turn feel strong enough to refuse to enter into any protection agreement, or they ignore its conditions if they sign it. Upon the first indication of trouble such an association applies promptly to national headquarters for assistance although unable to present a united front at home. In other words, the organization which has never lived up to the Baltimore Resolutions or any substitute for them, now demands that they shall be enforced to meet their case.

This is the state of affairs that exists to a very large extent throughout the country, in spite of the fact that instances are constantly occurring in which the powerful effects of a good agreement are practically demonstrated, and it is this that handicaps the national organization. It is like a general trying to win a battle with the aid of battalions of unarmed recruits, for these local organizations furnish no weapons to the officers of the national body.

It is always the weakest among local organizations that are the first to complain. An association that has barely kept itself together comes to the national body with a complaint. The first question naturally asked is as to what they have already done and the common answer is, nothing. They could not do much more for they are not organized and armed for the fray. The first work to be done in securing protection for the plumbing trade is to build up, arm and equip the local associations, enter into an agreement with local supply dealers by which mutual support shall be made to govern your relations, live up to it and see that the other parties do. The value of such an agreement will shortly make itself apparent; it will certainly bring in all outsiders if wisely administered. With an array of such organizations at its back, the National Association could demand anything needed by the trade that is rational with a certainty of obtaining it. This sitting down to cry for the National Association and neglecting near-by auxiliaries is, to use a common expression, "played out." There is nothing like a little self help; it is astonishing what a small amount of outside assistance it will entail and how much it is assured of in the event of actual necessity. Without a sufficient number of organizations capable of helping themselves, it is impossible for the National Association to extend aid to those who really deserve it.

THE DEATH OF JOSEPH A. MACDONALD.

The fraternity will grieve with us at the news of the death of President Joseph A. Macdonald, who was buried Wednesday, October 21st, at New York City. In his death the National Association and the New York Association and the trade throughout the United States lose an untiring worker and a faithful friend. It has been the writer's good fortune to have known President Macdonald and to have maintained correspondence with him since the organization of the National Association. And during our struggle with the manufacturers for what we deemed our rights, I had occasion to measure the men who took part in the struggle for trade protection. While Mr. Macdonald's policy was of a more conservative kind than our own, he sunk his own feelings on all occasions to aid us by word and deed on every occasion. Possessed of a magnificent presence it was but an index to the man within.

(JOSEPH A. MACDONALD.)

No western plumber who ever visited New York but that can remember his generous hospitality, and during the many years he has been associated with us he was ever ready to make pecuniary sacrifices for the good of the trade. Those who attended the Baltimore Convention will remember the dissension in the New York delegation, and may remember how deeply Mr. Macdonald felt over the matter. I remember well how he arose in the convention, and with tears in his eyes and his utterance choked, he said: "This is a sad, sad day for New York." This showed the pride of the man in his native state and city and the love he bore for his Association.

While visiting with him one of the magnificent flat buildings in which he was doing the work, he turned to me and asked: "Perhaps you are tired? But, Young, let my excuse be I love my trade," This was characteristic of Macdonald. He loved his trade, and the magnificent business he carried on proves the truth of his words. The world is better for the example shown in the lives of such men as Joseph A. Macdonald. Our heartfelt sympathy goes out to his family and friends in this their hour of trial.

RESOLUTIONS REGARDING THE DEATH OF JOSEPH A. MACDONALD.

At the regular meeting of the St. Louis Association of Master Plumbers last Tuesday evening the following resolutions were unanimously adopted:

Resolutions of sympathy on the death of Jos. A. Macdonald, President N. A. M. P.

Whereas, The St. Louis Master Plumbers' Association has learned with regret and sorrow of the death of Joseph A. Macdonald, of New York, President of the National Association of Master Plumbers of the United States, therefore be it

Resolved, That in the death of Joseph A. Macdonald, President of the National Association of Master Plumbers, the National Association has lost an able Executive Officer, and a worthy member of the fraternity.

Resolved, That the St. Louis Master Plumbers' Association tender their most sincere sympathy to the family of the deceased and condole with them, in this, their hour of bereavement and time of trial and affliction.

Resolved, That these resolutions be spread upon the records of the St. Louis Master Plumbers' Association, and a copy be sent to the family of the deceased.

Jno. P. Kelleher,
Wm. H. Kuhns,
Jeremiah Sheehan, Committee.

NOTES AND NEWS.

Michelson has calculated the velocity of light to be 186,360 miles per second.

Astronomers say a shot fired on the equator of Jupitor would travel at a rotary motion with a speed 46 times greater than that of a cannon ball fired at the earth's equator.

Waves exert a force of one ton per square inch when they are only 20 feet high. At Cassis, France, granite blocks of 15 cubic meters have been moved by wave force.

A new machine for charging gas retorts has been devised by Sir William Arrol and Mr. William Foulis, engineer-in-chief to the Glasgow Gas Trust. Their invention, which has been provisionally protected, will be put on trial shortly.

A "locomotive steamboat" is being built in Sweden for the navigation of a chain of small lakes separated by falls. The boat is to be fitted with wheels, and power can be applied either to the propellor or to the locomotive driving wheels.

Many uses have been proposed for aluminum, and in some instances this metal has been brought into actual use. One of its latest applications is in the making of photographic flash lights in the place of magnesium. A mixture of powdered aluminum and chloride of potash gives a brilliant flash without the smoke that is produced by magnesium, and this quality is in itself a strong recommendation.

The twelfth annual meeting of the American Society of Mechanical Engineers will be held at the house of the Society, 12 West 31st street, New York, commencing Monday evening, November 16th. Details of the program will be furnished later.

When an agent comes around and talks about fifty to seventy-five per cent. of your fuel bills by some attachment or other, politely show him the door. If he talks only five to ten per cent., listen to him.—Robert Grimshaw's Hints to Power Users.

A new coke furnace has been invented by a Belgian engineer, M. Martial Fromont. It is a reverberating furnace, capable of making coke from a coal much inferior to that generally used, and the cost is said to be 2s. 6d. per ton cheaper than the cost of producing coke by ordinary means.—*Invention*, London.

It has been estimated that one ton of coal gives enough ammonia to furnish about thirty pounds of crude sulphate, the present value of which is about $12 per ton, and there being 10,000,000 tons of coal annually distilled for gas, no less than 133,929 tons of sulphate, of the money value of $1,607.148, are produced.

Too many engineers behind the times still use tallow as a cylinder lubricant, says an exchange, and by so doing run a great risk of eventually destroying the engine, as the several fatty acids, stearic, oleic, margaric, etc., of which tallow is composed are almost sure to eat out the valve seat, piston rings and other parts of the cylinder. Some good mineral oil should be used, which is known to have a reputation.—*Invention*, London.

A pneumatic inner sole or sock for boots and shoes has been brought out to confer great benefits upon people who have tender feet, etc. It is made of hollow India-rubber, inflated with air or gas under pressure, the external protective covering being canvas, linen, skin, or other suitable material, to adopt it to withstand the internal pressure of the compressed air or gas.—*Invention*, London.

There no longer remains a doubt of the advantages of the shaking grate over the ordinary stationary bar. Our English cousins have carried the matter a step further and are using what they term "live fire-bars," *i. e.*, bars kept in continuous motion mechanically in the same manner that the grates of mechanical stokers are operated with us. By this means they are able to burn low grades of fuel without the continual use of the slice bar and with little trouble from clinker.—Power.

MEETING OF THE MICHIGAN STATE BOARD OF HEALTH.

The members present at the meeting of the State Board of Health at Lansing, October 13, 1891, were Prof. Vaughan, Prof. Fall, Dr. Gray, Dr. Wells and Dr. Baker.

The secretary presented letters from the mayor and others and a numerously signed petition from the citizens of Iron Mountain, setting forth that their city is suffering from a serious epidemic of typhoid fever, 436 cases and 32 deaths from typhoid fever having occurred from Aug. 7 to Oct. 6, 1891, and asking that the State Board hold a sanitary convention there, for the purpose of aiding the citizens in stamping out the epidemic, and stating that Iron Mountain had raised $250 for defraying the expenses of such convention. Although petitions for conventions at Holland and Charlotte had precedence of this one, on account of the very serious situation at Iron Mountain, the Board decided to accept the invitation and hold a convention there Oct. 30th and 31st.

The Board also appointed a committee to investigate an outbreak of diphtheria at Imlay City and vicinity, from which upwards of 70 cases and 14 deaths are reported to have occurred since August, 1890.

The secretary presented a report of typhoid fever in Deerfield township, where about 26 cases and 7 deaths have been reported since August 20, 1891.

Correspondence relative to a suspected case of leprosy in Michigan was presented, and also the reported casualties from kerosene oil during the past quarter.

In his report of work done during the quarter the secretary mentioned that the office had received notice of and taken action relative to 492 outbreaks of dangerous communicable diseases during the quarter, and 1,120 letters had been written.

Dr. Baker stated that, although the statistics show that through health measures—chiefly isolation, disinfection and vaccination—there has been recently a reduction of at least eleven hundred deaths per year in Michigan from the three diseases, small-pox, scarlet fever and diphtheria, there still remained seven thousand deaths per year from diseases known to be preventable through measures, the knowledge of which is being spread by the State Board of Health. He thought that an increase of the same work which has caused the reduction would be the most profitable use to which the people of Michigan could put a few thousand dollars and that a further reduction in the deaths can be made by the constant employment of more persons in health work, one or two of whom could be employed by the state to good advantage.

Prof. Vaughan spoke of one line of work which seemed to be specially needed—an inspector to visit and aid localities to stop dangerous contagious diseases. Typhoid fever and diphtheria are epidemic in places too numerous to be visited by members of this board, who, if they go, must leave their own business to work for the public without compensation. Something is being done now, but more ought to be done than can be done by members of the board.

THE PLUMBER CALIPH.

ACT I.—SCENE DITTO.

The beautiful heiress, Flossy O'Flannagan, is very readily discovered, sitting on a make-believe divan, singing "The Night Larry Was Stretched."

Enter the villain, Caliph Reginald McMud—Ah, alone. O, darling, long have I waited for this opportunity. Be my wife.

"What, base villain? You insult me. You're only a bank clerk. The president and cashier, both Sunday school superintendents, will have whacks at the safe before your time comes. Monster, leave me! Go! Avaunt! Get a wiggle on you!"

"Ha! Proud, scornful beauty, I will be revenged. Ha!" The curtain falls amid a burst of "toodle, oodle, oodle," by the band. All the men in the audience get up and go out to see a man, who

stands outside and gives away cloves. The women stare at each other for a few minutes and then turn up their noses. A little man in the band hammers a lot of little pieces of stovewood with a little hammer. This is called the xylophone rendition. During this saw-log solo the bull-fiddle goes "plunk! plunk! plunk!" Then the men come in with the cloves in their mouths, step on your toes and say "Shcuse me." When all these men sit down the band plays "Comrades," and then plays the last verse once more. Then the girl with the big hat gets in front of you again.

Ninety days are supposed to have elapsed between the acts, during which time Mr. McMud is said to have been in Nashville, Little Rock or where Judge DuBose puts deputy sheriffs.

ACT II, AND THE WIND-UP.

Miss O'Flannagan is sitting on the same divan. She sings: "He loved till he was dead" (broke). After giving her time to answer the encore Mr. O'Mud enters.

"Ha! girl, we meet again. Dost hear the wind outside? 'Tis the knell of your haughty pride [a man behind the scenes blows into a pickle bottle]. You refused me because I was poor and had to be honest. Now, rash girl, sue for mercy."

"Unhand me, villain!"

"Ha! mark my words. I am not a bank clerk; know me as I am. I am a caliph, a plumber, and have fixed a leak in the kitchen slop-pipe. Unless you consent to be my wife I will render an itemized bill and bring your father to beggary."

"Spare me. Spare me!"

"No I. I will further mention the candle and the boy who held it for me."

"You cruel man. Will no one save me?"

"I will."

"Who are you, kind sir?"

"I am Patsey Rafferty, your school-boy lover. I own a coal yard in Pinch and there is a cold spell coming."

Mr. O'Mud then says "Foiled!" and shoots his brains out, which doesn't hurt him in the least, as he dances with the rest while the curtain drops and the band plays "Annie Laurie."—*Ex.*

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

We have read the following, and much more of the same kind, as it came blowing in upon us:

Considerable attention has been given of late to the various methods of producing a more perfect combustion of fuel under boilers in producing steam. The down-draft system is being used by many manufacturers and others, though but little is said about it. In this method the grate bars are hollow and filled with water which is heated by the fire. The air is taken in at the top of the coal bed and drawn down through the burning fuel, then made to pass under a bridge (water back) also filled with water.

Under ordinarily careful firing the combustion is well nigh complete, as it ought to be for the plan obviates the very difficulty hitherto met with of the gases from the coal rising into cool air and being carried away from the ore at a temperature below the point at which combustion is effected. Theoretically the plan is in the line of correct scientific reasoning, and practically it is said to be giving great satisfaction. Of course, under careless feeding, coal being piled in large quantities, it will produce smoke and prove unsatisfactory. But with reasonable care in firing it produces little or no smoke.

Another thing in its favor is that it involves no change in the construction of the boiler and no extra machinery. The change consists simply in the substitution of hollow grate bars in place of solid ones and the hollow water back which acts as a fire bridge.

The furnace has been around and has shown some of being intended for a smokeless one. By way of showing their difficulties it is stated that, "of course, under careless feeding, coal being piled in large quantities; it will produce smoke and prove unsatisfactory." It makes no difference to me whether the draft be down or up, so that it produces the most perfect combustion. Give us perfect combustion and we will give you a smokeless city. You may control your draft any way to suit you, but it must suit us in producing combustion so perfect that no smoke will escape. We cannot deprive fuel of smoke unless we consume it in such a way as it will be rendered entirely free from smoke from the beginning to the end. It is seen how chips, or straw or anything else will burn when it is set fire right and attended properly. So it is with coal when it is managed properly about the fire. In using most any kind of a furnace, by carefully handling the coal and keeping it in a proper condition, smoke can be measurably prevented. But we do not want too much dependence put in the manner in which the coal is held. It matters not which way the draft is, so there exist those principles and arts which will reasonably assure no smoke will be produced. Let it come back and be sent through the fire again, if the first cannot take it out. There must be some way of getting this smoke out of the fuel without letting it boil out of the stack as unconsumed.

A gentleman asks us about the coal used for fuel here, and if it is not hard coal. There are hard and soft coal both burned here. Some factories burn hard coal, and some do not. The most use soft coal because it is considered cheaper than hard coal. There need be no doubt about the consumption of soft coal without making smoke. It has been done right here and is being done now by some. The atmosphere is now an improvement over what it was awhile ago, and we expect to do better yet. A new man cannot get to work and do as much as an old servant can or could have done. It takes time to learn, and our man seems to have been devoting himself to his business. He is gaining on the smoke, and it is leaving the Chicago field. There are devices made that will clear the air of smoke so sure as they are used, and this is what we suppose he wants to know when writing us about the use of soft coal.

Some are producing smoke to-day who have always produced it, and they will probably produce it all the time without any thought of the harm they are doing others. They do not understand that which they are producing, and could with little outlay of money prevent, is a great hardship on people who are a part of the town or near their smoky works. But this will do no good. The greatest smoke nuisance has no respect for anyone's feelings. It does not dally around the place where human affections hover. It is the law that must give such places their rights and protect them from this kind of nuisance. Nothing else will or can, and where man has not to be made do a thing he generally finds time employed. He could find the time but he does not have to. It does not have to be done.

STEAM AND HOT WATER HEATING SYSTEMS.

We extract the following from an article in the *Engineering Magazine* for September:

The amount of heat carried by a pound of steam, and the rapidity with which steam circulates through pipes, are sometimes made to appear important advantages as compared with the less heat carried by a pound of water and the slower circulation of the latter, affected solely by changes in specific gravity. While by virtue of its latent heat it forms in proportion to its weight the most admirable carrier of heat known to science, and by reason of its expansibility its rapid circulation in any direction is easily effected, yet the very fact that it is steam imposes a rigid limit of temperature that unfortunately cannot be passed. It never can be cooler than 212 deg. under ordinary atmospheric pressure, this pressure being a condition of all practical steam heating as applied to buildings. The necessity of some unbalanced pressure to secure circulation compels even a higher temperature than this, the temperature corresponding to the average low pressure maintained (five lbs. per square inch above that of the atmosphere), being almost exactly 228 deg. F.

Time and again attempts have been made to reduce the temperature in radiators by means of pressure reducing valves and regulating valves, but the fact that below 212 deg. F. there can be no steam and circulation ceases has barred any useful progress in this direction.

Within the last decade there has been a remarkable increase in the popularity of hot water heating, due to a combination of causes. There is a much larger proportion of our population possessed of means to purchase superior appliances than formerly. The extending taste for good solid reading has largely increased the stock of general information upon subjects pertaining to sanitation, among which the heating and ventilating of homes occupies a most important place.

While a pound of steam in condensing to water can give off

966.5 thermal units, and a pound of water in cooling from 180 deg. to 70 deg. can give off only 110 thermal units, it has been shown above that a pound of steam as ordinarily used for steam heating occupies a space of 20 cubic feet, or a space that would hold over 1,200 lbs. of water heated to 180 deg. F. A simple multiplication shows this volume of water to contain 130,000 available units as compared with 966.5 units in the steam filling the same space. It forms, therefore, a store-house for heat to which steam is in no way comparable, and the velocity of its circulation may be immensely lower than steam and yet is able to convey all and more than the radiators can extract from it. Hence it is that while the temperature of a room heated by steam falls rapidly whenever the fire in the boiler gets low, the water continues its action for a long time without any perceptible diminution. The sudden and violent fluctuations to which temperature produced by steam heating are liable are unknown in hot water heating. This is its crowning advantage. Uniform heating of buildings worthy the name "uniform" has never been reached by any other means.

But there is this important and fundamental distinction between the action of a steam coil or radiator and one which takes its heat from hot water, that whereas, as has already been shown, the former can only operate at the temperature of 212 F. and upward, the latter can operate at any temperature whatever that is higher than that of the air surrounding it. Thus, if air at 60 deg. F. envelopes the radiator and the apparatus is adjusted to heat water to 180 deg. F. as its maximum, there is a range of 120 deg. F. all through which the hot water radiator can work, and this range is perfectly controllable. In mild weather just the heat needed can be supplied and no more. As the weather gets colder the heating can be increased to meet the exact requirements. Compare this with a low pressure steam apparatus adjusted to carry steam at 228 deg. F., as its maximum. It cannot work below 212 deg. F., hence the difference between this and the maximum temperature, or 16 deg. F. is the range through which any variation is possible. The hot water heating apparatus, is therefore adapted to all climatic conditions, while the steam heating radiators, if proportioned to the demand for extreme cold weather, are and must remain too powerful for any weather much warmer than the extreme. For mild weather, when the steam heat becomes unbearable, the remedy is to open the windows and waste heat by these avenues to intersellar space or to shut off the radiators and send the waste heat out of the chimney, while the room cools down. In steam heating a condition of health and comfort is exactly reversed. The range of temperature variation which should be confined to the heating apparatus alone, is transferred to the apartments, which are now too cold and anon too warm, instead of being heated to a uniform pleasant and wholesome temperature.—*American Artisan.*

THE REMOVAL OF SEWAGE AFTER LEAVING BUILDINGS.

READ BY REGINALD E. MIDDLETON, MEM. INST. C. E., IN SECTION OF ENGINEERING IN RELATION TO HYGIENE, OF THE RECENT INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

The writer proposes, in the following remarks, to give a short description of different systems for the removal of sewage matter from houses and streets to the sea, to land, or otherwise; he desires to set forth as simply as possible the difficulties attendant on each system which has been adopted in the endeavor to find an efficient, economical, and rational means of removing sewage from its point of origin to that of disposal.

The system of sewerage which has been most generally adopted in this country, and which has existed from the earliest times, is that of large sewers calculated to admit of the passage of all the sewage matter and storm-water which the district receives.

So long as it was possible to turn the sewage thus collected into the nearest river or stream, or into the sea direct, this system of large sewers was the natural sequence of such disposal. But the injurious consequences of this course having become apparent, in the dangerous pollution of rivers and streams, and the offensive condition of the seashore in many places, whereby the country was to a considerable extent deprived of its most natural and least artificial source of water supply, it became necessary to enact that sewage matter shall not be turned into rivers unless it has been previously rendered innocuous. This enactment obliged engineers to consider the most economical and efficient means of transporting sewage to much greater distances than was formerly thought necessary; and as storm-water forms a very large proportion of the mass of sewage to be carried, one of the first questions to arise was as to whether the sewage matter might not be separated from the storm-water, and each dispose of in a different manner.

The systems to which attention is called, and which have been tried with the object of meeting these requirements, are the earth system, the pail system, the system of sealed cesspits, and the separate system.

The first-named system fails because it is impossible to ensure its proper use; because urine and slop-water are frequently mixed with the dry earth, which then ceases to be a disinfectant; and because it does not deal with the kitchen and bath water, with soap and fat, which must be turned into cesspits to ferment, or into water-courses to pollute them.

The pail system is an outcome of the earth system, and need not be more particularly referred to.

In the sealed cesspit system the sewage matter is discharged into what purports to be an hermetically sealed cesspit, and is removed by pumping into especially-constructed sewage tumbrils, and is carted away and deposited on land. It is clear that when any discharge is made into the cesspit the gases of fermentation come out by the same passage. The removal into the tumbrils is also offensive, and the system is not believed to be a successful one, though it has been largely used abroad.

The most important of the proposals which have been made is that of separating the sewage proper,—that is to say, the fæces, the urine, fat, soap, kitchen water, and the water of transportation,—from the storm-water; returning the latter to the nearest water-course, and only transporting the former to a distance, where it may be treated on land, chemically, by precipitation, by electricity, or by two or more of these systems combined, the effluent being then returned to the water-course.

Under the conditions which exist in this country, the proportion which the sewage matter at its maximum bears to the storm-water at its maximum, is probably about 1 to 25, while in tropical countries this proportion is greatly exceeded, while the duration of the rainfall is much concentrated, and the length of the time during which there is no rain is correspondingly increased. Assuming the above figures to be correct, sewers to carry storm-water must be twenty-five times larger than where sewage only is to be transported; these dimensions must be much increased when the rainfall is tropical; and these same sewers will in time of drought be almost empty, the rate of delivery will become foul to an excess, and must be dangerous to health, especially under tropical conditions of great heat and long periods of continued drought.

When brought face to face with these facts it seems to be almost obvious that the sewage proper should be dealt with alone, and that the storm-water should be separated from it, more particularly as the heavier portion of the matter to be transported, and that which is most apt to produce deposits and obstruction, is introduced into the sewers with the storm-water; the question, however, is not quite so clear as it seems to be at the first glance.

If the sewers are to be separate from the water-courses, the gradients of the former will be much steeper than those for the latter conduits. It would in most cases be necessary to have two sewers in each street, for all the house drains could not be connected to one, considering that the covered water-course would be in the middle; the crossings of streets would also offer considerable difficulties. But nothing is impossible; and these difficulties could no doubt be surmounted; indeed, this has been done. The question then arises, however, of how far it is safe to pass water mixed with the sweepings of streets, of courts and of yards, and the washings from the roofs of houses, directly into the nearest water-course without purification.

It has been contended lately that the number of microbes present in the dust of streets is greater than in sewers, due, it is said, to the more free circulation of air in the open than in the covered sewers, and this has been used as an argument against the ventilation of sewers. It may be that the number of microbes is greater in the streets than in the sewers, but this does not prove that the larger number are more dangerous to health than the

smaller supply, nor does the view that more is to be feared from street-sweepings than from sewage agree with experience, it having been frequently noted that foul water-courses remained innocuous so long as they were open to the air, but became exceedingly injurious to health when covered in. However this may be, the question remains, is it safe to turn water which has passed from the roofs of houses, and over the surfaces of streets and yards, direct into the nearest water-course? The writer does not feel able to deal with the chemical view of this subject.

The advantages which the separate system offers appears to be:—1. The use of very small sewers. 2. A fair amount of regularity in the amount of sewage passing through the sewers, which will not vary greatly either in quantity or quality, and which will at certain known times every day carry a known maximum and minimum of sewage. 3. The gradients can be arranged to give a minimum rate of flow which shall not allow of deposit. 4. Where pumping has to be employed, the volume to be pumped is reduced to a regular diurnal unit, as against a quantity which may vary in the proportion of from 1 to 25 or more according to the rainfall, and which necessitates the use of pumping machinery, tanks, and other appliances calculated to deal with the larger quantity. 5. The comparatively small alteration of the level of the sewage matter in the sewers, and the fact that the variation in the rate of flow would be reduced and the average rate made higher, should tend to prevent pressure from the evolution of gases, and should shorten the time of delivery,—and, therefore, that in which fermentation can take place,—and should tend to health. 6. The heavier matter, such as road-scraping, coal-dust, etc., is not passed into the sewers, but into the water-courses, and the former should, therefore, be maintained free from deposit with great facility. 7. From the small size of the sewers, and the comparatively regular flow of sewage in them, they offer great facilities or more thorough and regular ventilation than has been hitherto ound possible in the larger sewers.

Against these advantages must be placed the increased compliance of the drainage system, not as a whole, but in the streets: and the fact that as the gradients of drains of small size must be steeper than of those which carry a larger volume, the height through which the sewage has to be pumped, where pumping becomes necessary, will be greater than for larger sewers, though the quantity to be dealt with is much less; the proportion, can, however, be only decided for each particular case.

The separate system appears to offer many advantages for the collection of sewage, in very flat districts, in receivers of limited capacity, placed at comparatively short distances apart, whence it may be discharged or pumped to a higher level by steam power or by water or air pressure supplied from a central station. It is thought that the use of air is most advantageous for this purpose, as very much smaller pipes can be used for its transmission than is possible when water is employed as the motive power; a speed of 60 feet per second being quite admissible when air is used, while 3 feet per second would be about the limit for water, and there is no shock with the first-mentioned form of power, while there is considerable shock with the second. The efficiency obtained with the use of compressed air is considerable, and might, it is thought, be greatly increased by its more careful and scientific employment, both as regards the construction of receivers, the height of the lift, in the compressing machinery, by the reduction of waste space, and in heating, and by the expansive use of the air.

Where water is used as the motive power, space must be provided in the sewers or water-courses for the exhaust water, while the air may be discharged into the sewer without taking up useful space, and may serve to ventilate it. On the other hand, this air, which has been in intimate contact with sewage matter (presumably, however, little fermented) may be discharged into the streets through some opening, and may become a source of danger.

The writer wishes to call particular attention to the necessity which exists for considering each locality on its own merits and conditions, and for providing a system of sewerage which is applicable to those conditions. The same sewers which may do very well in a hilly country are not adapted to one which is flat. A system which is successful in a temperate climate, where the rainfall is moderate and much diffused, is not necessarily adapted to a tropical country, where the heat is great, and the rainfall is excessive and concentrated. The separate system is, no doubt, not univesally applicable, but the writer believes it to have many advantages which only require consideration to be recognized.

CONVENIENT TO HAVE ABOUT.

An efficient method of cleaning marble is to coat it with a compound of soap lees intermixed with quicklime and brought to the consistency of milk. After twenty-four hours, the whole is washed off with soap and water, and the marble, when dry, is rubbed with fine putty powder and olive oil.

Test for copper: If present it will turn a bright polished steel a copper color. Second: A few drops of ammonia will turn it blue if copper is present.

Test for hard or soft water: Dissolve a quantity of good soap in alcohol. Let a few drops fall into a glass of water. If it turns milky it is hard; if not it is soft.

Test for iron: Boil a little nut gall and add to the water. If it turns grey or slate, black iron is present. Second: Dissolve a little prussiate of potash, and if iron is present it will turn blue.

Test for acid: Take a piece of litmus paper. If it turns red there must be acid. If it precipitates on adding lime water it is carbonic acid. If a blue sugar paper is turned red, it is a mineral acid.

Test for lead: Take sulphurated gas water and equal quantity to be tested. If it contains lead it will turn a blackish brown. Again: The same result will take place if sulphate of ammonia be used.

Test for carbonic acid: Take equal parts of water and clear lime water. If combined or free, carbonic acid is present, a precipitate is seen, to which, if a few drops of muriatic acid be added, an effervescence commences.

Experiments on the action of different oils on metals show that bronze is much corroded by linseed oil, slightly by olive oil, and not at all by colza oil, and that for lead the safest lubricant is olive oil and the worst whale oil.

Test for magnesia: Boil the water to a twentieth part of its weight, and then drop a few grains of neutral carbonate of ammonia into a glass of it, and a few drops of phosphate of soda. If magnesia is present it will fall to the bottom.

Tests for earthy matters or alkali: Take litmus paper dipped in vinegar, and if, on immersion, the paper returns to its true shade, the water does not contain earthy matter or alkali. If a few drops of syrup be added to a water containing an earthy matter, it will turn green.

Anyone can make hand-grenade fire extinguishers, and at a small fraction of the prices being charged in the market. Any light quart bottle will serve to hold the solution, which is composed of one pound of common salt and one-half pound of sal-ammoniac, dissolved in about two quarts of water.

A rich and brilliant effect is obtained in walls about to be decorated by mixing an equal quantity of marble dust with the lime used for the last coat of plaster. This gives a softness of tint which cannot be obtained with ordinary plaster. In Italy it has long been the custom to give a final coat of marble dust to walls intended to be treated by the wet process.

THE STRENGTH OF MATERIAL.*

It is not usual to consider the work of the fireman as professional, but, nevertheless, in some respects it resembles that of the physician. When taken suddenly ill we telephone at once for a doctor, who, though a stranger, is expected to not only know the disease and its remedy, but also to understand the individual constitution of his patient and recognize at once its weaker parts—those in which the disease is most likely to get beyond control; so the fireman, when called to action, is supposed to be able to recognize at a glance the weak points of a burning building and at the same time discern all the natural channels it affords for fire, but as fortune will have it, the mistakes of the doctors are buried and those of the firemen are burned.

Engineers, with plenty of time for mathematical investigation, find it very difficult to determine with certainty which are the

* Paper read by F. R. Richmond before the nineteenth annual Convention of Fire Engineers held at Springfield, Mass., August 11-14, 1891.

weaker parts of a building and to ascertain positively their actual strength; how, then, can a person in a burning building determine in which part the fire can be fought safely and most successfully? The circumstances render imperative that this must be wholly a matter of judgment, therefore a few hints that are calculated to assist the judgment and render it more reliable will not be out of place here. It may be improved by cultivation and close observation, and for this purpose it may be well to fix in mind a few facts, and this may be done without taking a regular course in a technical school. In estimating the strength of different parts of buildings, it should be borne in mind that beams decrease in strength much faster than the length is increased; for instance: If a beam of any given size, twenty feet long, will sustain a load of 100 pounds per foot, one of the same size and forty feet long will sustain only twenty-five pounds per foot and that with much moredeflection, while the same beam cut down to ten feet in length would carry 400 pounds to each foot in length.

With posts, the ratio of strength to their lengths differs somewhat with different materials and different proportions; but roughly speaking, posts of sizes in common use diminish in strength as they are increased in length in a ratio of about ⅓ to 2; that is, if a post of a given size and 10 feet long is capable of supporting 12 tons, one of the same material and size but 20 feet long will support but 4 tons. The comparative strength of rods sustaining loads by suspension is not materially affected by their length; a long rod of a given size is nearly as strong as a short one of the same dimension.

Now with these general principals in mind, let us remember as a base for calculations a few examples. Take first a mill 50 feet wide, three 10-feet stories in height, of the usual "mill construction," center posts and beams 8 feet between centers, making the beams 25 feet long from posts to wall. To safely carry the ordinary load of 100 pounds per square foot, the beams should be of Southern pine 12x16 inches, with round posts 11 inches in diameter or 10 inches square, post in the first story to support the second and third floor and roof; 10-inch round post or 9x9 in the second story for the support of the third floor and roof, and 9-inch round or 3-inch square to carry the roof. A 15-inch I-beam 150 pounds per yard, this length would be of about the same strength as the 12x16-inch beam. A 6-inch round wrought-iron column of ⅝-inch shell, or a 6-inch cast-iron column free from defects with a ½-inch would be about the same strength as the 10x10-inch posts, cast iron being stronger in columns than wrought-iron, except where they are very slender. Iron will not resist heat as long as wood, wrought iron becoming soft and pliable and iron cracking with heat and water. If a brick pier is to carry the load of 10x10-inch posts it should be of good masonry 2 feet square, or at least 20x24 inches, and it will resist heat longer than any of the other materials mentioned. A 1¾-inch iron rod will safely support by suspension the same amount of floor surface of a single floor as is carried by one of these posts.

If it is desired to use this building for a warehouse, to be filled with barrels of flour, it should be estimated at 400 instead of 100 pounds to square foot, and it would require another row of posts between the center post and each outer wall, thus making the beams about 12 feet between bearings, the beams remaining the same size and the post increased a little, the wood about 1-inch or ½-inch for the iron.

Now let us consider another type of building, a warehouse intended to be filled with flour making 400 pounds per foot. Suppose the building to be 30 feet wide, and in height three stories of 10 feet each, with joists running crosswise, and under them a center beam running lengthwise of the building with posts to support this beam. The joists placed 10 inches between centers should be 4x14 inches and the beam supported with posts 10 feet apart should be 12x16 inches. The posts should be 12x12 in the first story, 10x10 in the second and 3x3 to carry the roof. If cast-iron columns are used in the first story they should be 7-inch diameter with ¾-inch shell, and wrought-iron of the same thickness shell should be 9-inch diameter, and a well-built brick pier should be 2 feet and 3 inches square. As brick piers are liable to split under heavy pressure they should have strong bond stones every 3 or 4 feet in height.

If the building as described above is to be loaded only 100 pounds per foot, the joists would be 2½x10, placed 18 inches between centers, the beam 10x12, and the first story posts 8x8 or 5-inch diameter ½-inch shell iron column, the posts, above 7x7 and 6x6. The timbers are all estimated for Southern pine, but if spruce is used instead it will safely carry about 4.5 as much load.

Take a store 40 feet wide with a row of columns in the center 12 feet apart, and above the store four stories of rooms to be used as offices or chambers. The joists should be 3x12, placed 16 inches between centers, and the columns should be 12-inch diameter if of Southern pine or oak, or if of either Southern pine or oak, or if of cast-iron 7-inch diameter ¾-inch shell. If all the materials mentioned were free from defects and rightly set it would require to break any of them about six times the load assigned to them.

The strength of brick walls is largely increased by buttresses, breaks, cross-walls and other lateral supports, and decreased by openings, so that a thickness that would be very strong under some circumstances would be weak under others; but straight, solid, well-built walls commonly should be 12 inches thick in the two top stories, 16 inches for the two stories next below, 20 inches for the fifth and sixth from the top, 2 feet below these, so on, increasing 4 inches for each two stories downward, and of course warehouses and buildings for heavy uses should have thicker walls, while ordinary partition walls built near together many be thinner. Arches in brick work are very strong if sufficient provision is made for sustaining their thrust, but often the bottom of arches spreads and the brick work above cracks, and too often solids are placed over openings with openings over solids, thus concentrating large loads on small portions of masonry, resulting in the cracking of the walls.

A ½-inch rod may be safely relied upon to carry 1 ton: a 1-inch rod, 4 tons; a 2-inch rod, 16 tons, and a 3-inch rod, 35 tons, and if of good quality it would require six or seven times this to break them with a suitable truss to sustain the upper end. To discuss the strength and strains of different parts of the different styles of trusses would make too long an article for this place, but as a rule the weakest point of a truss is at the joint of the bottom of the braces to the tension cord. When a fireman is called to enter a burning building he has no time to remember and apply all these figures, but by fixing these and others in his mind and improving his daily opportunities to estimate the strength of different buildings, searching out their weak points, he will acquire the habit of judging at sight the relative strength and safety of buildings, and cultivate his judgment so that it will be of great value in cases of emergency.

THE CAUSATION OF DIPHTHERIA IN ITS RELATION TO SANITARY ENGINEERING.

The recent marked advance in definite, precise knowledge of the nature and peculiarities of the immediate cause of diphtheria is of much interest and importance to practical sanitary engineers and inspectors, especially in its relations to house drainage and sewage disposals, says the *Engineering Reeord*. For the last ten or fifteen years it has been suspected that the immediate cause of diphtheria was some form of micro-organism, but the physicians and bacteriologists could not decide as to its precise nature or modes of development, as to how it produced its effects, nor as to why these effects differed so greatly under different circumstances. Fifteen years ago diphtheria was reckoned as one of the typical filth diseases, and when it occurred in a city house it was supposed to be due to sewer gas escaping into the dwelling through improperly arranged or badly constructed plumbing, and the supposed dangers from this source were used as an argument against any general system of sewerage for a city.

Continued investigation, however, showed that diphtheria was most prevalent and most fatal in rural districts and villages, especially in the northwest, where there were no sewers and no house plumbing; that direct contagion through schools, etc., appeared to be the most important factor in causation; and that, while local collections ef excreta or other decaying matter were often found in localities visited by diphtheria epidemics, yet the disease occurred in a virulent form in houses which seemed to be clean and well arranged, and in which there were either no sewer connections at all, or only such as seemed to be thoroughly satisfactory in plan and workmanship.

Under these circumstances, it is not to be wondered a that en-

gineers and plumbers began to doubt as to what had best be done to prevent outbreaks of this disease and as to whether it was not a matter of isolation and police regulation rather than of drainage and refuse disposal. It may now be said to be definitely settled that true diphtheria is caused by a bacillus of a peculiar kind—the *bacillus diphtheriæ*—or, as it is often called, from the names of the German physicians who discovered it, the Klebs-Loffler bacillus. It is a slender rod-like organism, motionless, about as long as the tubercle bacillus, and grows well at temperatures of from 75 deg. to 100 deg. Fahr., when placed in ordinary culture media. It will not multiply at a temperature below 60 deg. Fahr. and it is killed by exposure for ten minutes to a temperature of 137 deg. Fahr. It multiplies well in milk, and is unlike the tubercle bacillus in that it may readily find conditions of temperature and nutritive material outside the body which are suitable for its growth. It preserves its vitality for a long time, although dried, subjected to cold, etc., and for a still longer time in moist places. It has been found alive in a dry cloth, after five months, and in a damp room it may live a year or more.

By inoculation of pure cultures of this bacillus in cats, rabbits, guinea pigs, or pigeons, a disease can be produced which is in all essential points identical with human diphtheria, and no other bacillus is known which will do this. These effects include not only the production of a grayish false membrane at the point of inoculation, but certain peculiar changes in the kidneys and liver and subsequent muscular paralysis. Not all throat inflammations with false membranes are due to the diphtheria bacillus, though they may greatly resemble the disease produced by it. On the other hand, a very considerable proportion of the cases reported as membranous croup are true diphtheria, due to the specific bacillus, and hence in comparing the statistics of the prevalence of diphtheria at different times and places the corresponding data for croup should also be compared.

The diphtheritic bacillus develops only locally at the point where it is deposited; it does not enter the tissues or the blood, but produces its harmful effects through an extraordinarily poisonous soluble substance which it secretes, and hence the early treatment of the local throat affection is of the greatest importance. It is, however, with questions of prevention rather than of treatment that we are now concerned. The chief source of the diffusion of the diphtheritic germs is the living, human body, and for the moist germs this diffusion does not occur through the air, but through the common use of cups, spoons, etc., or by kisses. The diphtheria bacillus is not likely to be conveyed through the air unless it has been dried. An open tub full of diphtheritic membrane in a room would cause little danger to those who came into the room so long as its contents were kept thoroughly moist. On the other hand the presence of the moisture prolongs the life of the germ, and its vitality is soon destroyed by direct sunlight; hence, damp, ill-lighted basements, closets or corridors, are specially apt to become sources of infection. It will be seen that the darkness, moisture, temperature, and organic matter in soil-pipes and sewers furnish favorable conditions for the multiplication of the germ, but that the bacilli must in some way become dried and detached in the form of dust in order to be conveyed by sewer air.

Upon the whole it would seem that diphtheria is rarely spread directly through sewer connections or by sewer air, the chief danger in this respect arising when a house has been closed for several months and no water has been run through the fixtures. The specific diphtheritic bacilli are in most cases present only in the false membranes and discharges from the nose and throat of the patient, and it is by the soiling of the person, clothing, floor, etc., with these discharges—which may then become dry and form a dust which can be carried about by air currents—that the ærial contagion of the disease is produced. If efficient measures are carried out for the disinfection of these discharges as soon as they are produced, and while still in the worst state, there is little danger that the room will become infected.

When an outbreak of diphtheria occurs, the possibility of its conveyance by milk, and also by pet animals, such as cats, should be borne in mind. Undoubtedly, attention should be given to the plumbing, and to the cleanliness, dryness and illumination of a house in which cases of diphtheria have occurred, but the thing to be borne in mind is that there are in most cases secondary and not primary causes, and that the most perfect sanitary condition of a house will not prevent the occurrence of diphtheria in it if the children are exposed to the contagion at school or elsewhere—nor will it hinder the spread of the disease if parents and nurses do not guard against the contagious discharges and properly treat the lips, cups, spoons, handkerchiefs, etc., which they may have contaminated.

GARBAGE OF MILWAUKEE.

Upon the adviceo f the city engineer, Mayor Somers, of Milwaukee, Wis., has come to the conclusion that it would be best to delay the adoption of a permanent plan of disposing of garbage for a few months.

The reason for this sudden change of attitude on the part of these officials is that they wish to avail themselves of the information on the subject of city garbage, which is now being prepared by the census bureau. That institution has sent special experts to all the cities of the country and obtained the most minute data relating to the various systems in use, their success or failure, the cost of the various plans, and other information of like character. This mass of facts will probably not be ready for publication for a long time to come, but it is believed that it will be in such shape as to be intelligible within about two months. The mayor's intention is to obtain from the census bureau access to these data for Mr. Benzenberg or some other expert, and then have him submit to council what he has learned from the collections of the bureau.

"I do not think," said Mr. Somers, "that there is now, during the winter months, an urgent necessity for the permanent settling of this matter, and we had better go slow and obtain all the information possible. Otherwise we might make some very expensive mistakes. Dumping the garbage in the lake is of course not the ideal method, but it must be considered that all the garbage the city could dump during six months would not contaminate the water to the same extent that a single day's sewage from Milwaukee, Chicago and the other cities along the lake shore does. At all events, a few months more or less does not make much difference."

MILWAUKEE MASTER PLUMBERS' RULES.

What is known as the five-year apprenticeship system has been adopted by the Master Plumbers' Association, and a new set of rules governing the employment of apprentices in this city went into effect October 1st.

The old custom of indenturing or "binding over" apprentices has gone into disuse in most trades, but the plumbers have decided to return to it, and they have decided that an apprentice must spend five years in attaining the dignity of journeyman. The new rules are as follows:

First.—That the term of the apprentice shall be five years; three years as helper, and the remaining two years under instructions.

Second.—All apprentices must be 16 years of age or over, and must be able to read and write the English language.

Third.—All applicants for apprenticeship shall be received on six months' trial; if at the end of that time the applicant is found competent and capable of learning the trade, he will be bound as an apprentice for the term of five years, allowing the six months served on his time.

Fourth.—That the apprentice agrees not to join any labor organization during his term of apprenticeship.

Fifth.—Wages for the first year, $2.50 per week; second year, $3.00 per week; third year, $3.50 per week; fourth year, $1.00 per day; fifth year, $1.50 per day.

Sixth.—That the names of all applicants for apprenticeship and apprentices must be filed with the Plumbers' Association, who shall be required to keep a register for that purpose.

Seventh.—These indentures are for a term of five years.

Eighth.—Resolved, That any member of this association knowingly enticing or receiving into his service an apprentice of a brother member, without the latter's consent, or without full dates and signatures, shall be subject to reprimand or expulsion, at the discretion of the association.

A new set of shop rules, defining the duties of apprentices, have also been adopted, but they do not differ essentially from those in force heretofore.

At the last annual meeting of the United Association of Journeyman Plumbers, Gas and Steam Fitters, held at Denver, a resolution was adopted in which the journeymen declare themselves as follows:

It is the sense of the convention that it would be advisable to request the master plumbers in all large cities to adopt the five-year system with apprentices. As it is now, a master employs an apprentice, and after he has labored two or three years he demands more wages of his employer. As a general thing the demand is not acceded to, and the apprentice bowls on from one plumber to another, learning a little of this and still less of that, until finally he becomes a disgrace to the trade. It is the custom in some sections for the master to employ an apprentice and bind him for five years. In doing so he becomes responsible for the boy's education, and if he turns out a bad plumber the master is held responsible.

In some cities the apprentice is examined at the end of his term by a board, consisting of five masters and five journeymen, who certify to his fitness, if he is found competent.

DES MOINES' PAVEMENTS.

Speaking of putting in sewers and paving streets, a gentleman who has been connected with the municipal government of Des Moines in one department or other for years, remarked as follows; "We are through with cedar block pavement, and during the past year have laid large stretches of brick. We have a rule in regard to paving that we never violate. We lay no pavement except on streets where the water pipes and sewers have been down for two years. This allows the dirt in the trenches to settle sufficiently so that the earth foundation for the pavement is solid and no unevenness in it is caused by settling after it is laid. No, we do not have any trouble with soft brick because we have good inspectors. We expect also to adopt a rule that is now in force in Cedar Rapids to prohibit the laying of water pipes, sewers, etc., on the streets. We will make them put these pipes down in the alleys, and when a pavement is down it is there to stay. We are certain that brick paving is a success. We have tried it long enough to know."

WATER WASTE PREVENTION IN MONTREAL.

The prevention of water waste has received considerable attention in Montreal, says the *Engineering Record*, and the following abstract of a recent communication from Mr. B. D. McConnell, Superintendent of Water Works, explains the methods employed to diminish the evil in that city.

The highest fine that may be imposed for wasting, is $20. In point of fact, only aggravated cases get even as high as $5, the aim of the prosecutions being more to give publicity to the offenders through the press. The knowledge thus given to the public that the department is on the lookout for persons violating the by-law in reference to the use of water, has, it is believed, the salutary tendency to make them generally careful as to the condition of their fixtures.

Meters are not used on domestic supply. While admitting that they are the best preventative of waste, Mr. McConnell considers that their use in such a place tends to reduce the legitimate use of water, as well as the waste, a condition of affairs he considers far from desirable.

The inspecting force consists of 12 inspectors. The house inspectors visit all the buildings in the city about twice a year. They have a field book, containing headings on each page for the location and kind of building, general condition and size of pipe, size and number of faucets, sinks, water-closets, urinals, ball cocks, cisterns, wash-basins, fountains, hydrants and water engines. There is also a space for giving the total waste in gallons per hour. The inspector fills out these blanks, and then the fine, if any is due, can be properly imposed. If the quantity wasting is above 30 gallons per hour, the inspector gives the tenant 24 hours' notice, and if the leaks are not repaired on the inspector's visit at the expiration of that time, prosecution follows. For over 60 gallons an hour, prosecution is begun without notice.

The inspectors also look after contractors who have permission to use fire hydrants to draw water for making mortar for sewers or concrete roadways, and compel them to use the cock, cap and nozzle attachment prescribed by the department to minimize waste.

The meter inspectors, two in number, take the readings of the water meters in the city every month, and rate the steam engines (unmetered) every year. They are also required to notify the house inspectors of any waste they may find.

The meter tester repairs all the meters out of order, notifies parties to have their meters properly connected, and reports such connections to the head office when the inspectors take up the readings. Nearly all the manufacturing places take their water by meter.

DISINFECTION.

By a decree of the police authorities of Berlin, dated February 7th, 1887, it was rendered compulsory to disinfect the dwellings as well as the effects of patients suffering from a lengthy category of infectious disorders. Not only were the clothes, bedding, and all articles used by the sick person to be operated upon, but the walls of the sick chamber were to be rubbed down with bread as prescribed by Pistor, this plan being preferred to the use of the corrosive sublimate spray which was advocated by the author, and all the furniture was to undergo special treatment. The house disinfection is carried out, upon a plan devised by the author, by the experienced trained staff. It was arranged that the services of a certain number of work-people should be obtained from an existing society upon a fixed payment of six marks per head per diem. These men had to receive special instruction under Mr. Goldner to qualify them for their duties, and they were furnished with the requisite appliances, chemicals, etc. The precautions to be observed in the case of utensils, polished furniture, floors, etc., are laid down. All fabrics, bedding, clothing, etc., are packed up by the workmen, and disinfected by steam at the central station. In certain cases respirators of peculiar construction are worn by the operatives. The official instructions for the work are printed in full, and a list is given of sixty-three articles of dress, pieces of apparatus, etc., required by the staff. A tariff has been drawn up for the payments to be made of the work. Statistics are given of the number of rooms and dwellings operated upon, and of the cubic contents of the fabrics, etc., disinfected at different dates.

FOR THE DIGESTION.

At this season the poor actor and the poor stove both fail to draw.—*Binghamton Republican.*

If ghosts walked some of the epitaphs in the cemeteries would be effaced.—*Pittsburg Dispatch.*

Fruit Vender—"I feela bada." Faithful Wife—"Why you feela bada?" Fruit Vender—"One of the peaches I sella thata man was gooda."—*Good News.*

Doctor—"It is a little difficult to diagnose your case. Perhaps you have been eating too much." Patient—"Impossible. This hotel is run on the European plan."—*New York Weekly.*

Bobby—"What is a nursery, Uncle George? Sis says it's a place where they raise trees." Uncle George—"Sis knows better than that. It's a place where they raise thunder."—*Boston Journal.*

"I never pays no attention ter de man dat talks loud and boisterous in an office," remarked the new office boy. "He only acks dat way down town cause he dasn't at home."—*Washington Star.*

"This tipping business is beyond all proportions," grumbled De Peyster; "why, I cannot even get my hat to convey my respects to a lady on the street unless I tip it."—*Baltimore American.*

"Look here," said an excited man to a druggist, "you gave me morphine for quinine this morning!" "Is that so?" replied the druggist. "Then you owe me 25 cents. That's the difference in the price."—*Brooklyn Life.*

The statement that a detective recently caught a cold has been received in suggestive silence.—*Binghamton Leader.*

We still cling to the simple fable that the acme of human wisdom is to know when to lay down a poker hand.—*Texas Siftings.*

Cupid, the god of love, is represented as being blind. This probably has resulted from his doing so much business with the lamp turned low.—*Philadelphia Times.*

"I feel constrained to tell you, Fred, that I have been engaged before this," she whispered. "Don't mention it," he said, gently; "I too have been jilted."—*Harper's Bazar.*

It is a well-established principle of economics that the young man who would get up with the sun should not stay up later than 10 o'clock with the daughter.—*Lancaster Times.*

There are a hundred good lessons you can learn from the falling of the leaves. One is that when you take a drop too much you are likely to be picked up.—*Baltimore American.*

"How came you to construct such a lax divorce law?" "Pardner," replied the South Dakotan, "them that goes to our state for divorces has to buy real estate to acquire a residence."—*Indianapolis Journal.*

Young Husband—"O, but I am happy now that Laura has given her hand into my keeping for life." Pessimistic Friend—"Still don't be too exultant. Remember that her other hand is loose."—*Fliegende Blatter.*

A cyclone is like three school girls walking abreast—it doesn't turn out for anything.—*Texas Siftings.*

There is a good deal of public praying done that doesn't mean anything in heaven or on earth.—*Ram's Horn.*

A good liar is better company than a truthful man with an impediment in his speech.—*Drake's Magazine.*

The time comes when some men leave father and mother and cleave unto their uncle.—*Binghamton Leader.*

The week ought to be short for the servant girl, considering the number of days she takes out.—*Elmira Gazette.*

Reading maketh a full man—that is, it fills his mind with words that he does not know how to pronounce.—*Indianapolis Journal.*

"Now," said the professor. "I want you to illustrate the difference between music and noise." "Your own singing and somebody's else," replied the pupil confidently.—*Washington Star.*

CHICAGO MASTER PLUMBERS.

The regular meeting of the Chicago Master Plumbers' Association was held at their hall Thursday evening, October 22. The regular order of business was suspended and a committee on resolutions on the death of President Joseph A. Macdonald was appointed. The committee consisting of Alexander Murray, Thomas Cullerton and Andrew Hickey retired and reported appropriate resolutions on the death of our national president. Remarks were made by President Whiteford, T. C. Boyd, Alexander Murray, and others expressing sorrow at the great loss sustained by the trade and the national association in the death of our chief. Out of respect to the memory of President Macdonald no other business was transacted during the meeting.

PLUMBING NOTES.

A plumber hunted for a natural gas leak in the residence of John Summerland, of Wabash, Ind., with a lighted match and found it. The explosion stripped off the plastering, lifted the floor of the dining-room, broke up a heavy dining-room table and otherwise injured the building.

Ed. Greene, the poet-plumber of New York, has been at it again. His latest musical composition, entitled "Standing by the Darksome River," has just been published by S. T. Gordon & Sons, 13 East Fourteenth street, New York. It is a companion to "The Bridge" and is one of the most tuneful of his many excellent compositions, the words being both appropriate and beautiful. It has been dedicated by the author to the editor of the *Sanitary Plumber*, and is likely to prove a big success in every respect. It will be played and sung in all the leading theaters in New York and neighboring cities.—*The Sanitary Plumber.*

It is an Englishman who comes forward this time with an ingenius device that is likely to lessen plumbing bills this winter. It consists of a very simple means of preventing pipes from bursting by frost. A cup-shaped air chamber is attached to a piece of pipe, which can be coupled at both ends with the pipe to be protected. The air chamber is separated from the water flowing through the pipe by means of a rubber diaphragm. In case the water in the pipe freezes, the expansion of the water instead of finding an outlet by bursting the pipe, simply forces the diaphragm to yield, thus compressing the air cushion within the cup. It is said that a pipe so protected will have entire immunity from bursting by frost.

At the 17th annual congress of the Sanitary Association of Scotland, held in the council chamber, Edinburgh, under the presidency of Dr. Robert Farquharson, M. P., Mr. Alexander M. Scott, writer, Glasgow, read a paper on the national registration of plumbers in its relation to public health. He recalled the circumstances attending the inauguration of the movement for the national registration of plumbers, and explained that the district councils of the body had nothing whatever to do with any trade organization, but existed solely for the benefit of the public. Since the movement had been set on foot a considerable number of technical classes in plumbers' work had been established over the country, and the attendance at these had been large. While such good was being derived from the registration movement, it was, of course, in the future that its full benefit from the point of view of public health would be felt, when the rising generation of plumbers all over the country should have a technical as well as a practical training. Hitherto no parliamentary powers had been asked in connection with the movement, but now that registration was general, the time was ripe for introducing a bill into parliament in order to obtain the necessary disciplinary powers for the satisfactory carrying out of the system. It was desired by the trade that a parliamentary measure such as this should be passed. The proposed bill was drafted, and had the approval of the recent congress of Scottish district councils in connection with the registration movement. It was not intended that the bill should act compulsorily on the trade; the object was to obtain powers for the formation of a council of competent jurisdiction and authority to take measures for systematically promoting technical education among all plumbers in the United Kingdom and for regulating the classes of those plumbers who were enrolled as registered plumbers. The registration movement and the proposed bill were in the interests of public health of the community.

WHERE PLUMBING WORK IS BEING DONE.

GIVING IN THE ORDER NAMED LOCATION WHERE PLUMBING MATERAIL IS WANTED, NAME OF PLUMBER AND HIS BUSINESS ADDRESS, PREPARED EVERY WEEK FOR THE CONVENIENCE OF DEALERS.

2180 Archer ave., J. Killian, 333 22d street.
335 Adams street, J. Killian, 333 22d street.
Ashland ave., N. of Belmont ave., C. Redieske, 99 Clybourn ave.
7331 Center ave., J. Bain, 6338 Justine ave.
4819 Cook street, C. Kostlevy, 218 W. Eighteenth street.
47th and Court streets, Molter & Kretchmer, 426 E. Division street.
Hoyne and Augusta streets, Bowman Bros., 687 W. Chicago ave.
Lake street and Ashlaad ave., Bowman Bros., 687 W. Chicago ave.
Rockland and Grand aves., J. A. Milne, 1353 W. Lake street
4845 Robey street, C. Kostlevy, 218 W. Eighteenth street.
375 23d street, J. H. Killian, 333 22d street.
471 37th street, C. Kostlevy, 218 W. Eighteenth street.
958 Troy street, C. Kostlevy, 218 W. Eighteenth street.
538 25th street, C. Kostlevy, 218 W. Eighteenth street.
983 Washtenaw street, Harvy & Mose, 665 W. North ave.
Wood and Lull streets, Kretchmer & Kurtz, 379 W. Eighteenth street.
Yale street, S. of 70th, L. Clark, 345 63d street.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Thomas W. Wing has planned a 4-story and basement flat building, 100x130, to be built at the southwest corner of Indiana avenue and 26th street, by George V. Hankins; heated by steam; cost, $75,000. Adler & Sullivan have designed a 6-story addition to the factory of Brunswick, Balke & Co., at Superior and Sedgwick streets. It will be 100x85 and will cost $35,000. For Dr. C. H. Berry they have designed a 2-story and attic residence, 35x57; cost, $10,000. George H. Borst has designed a handsome 3-story residence, 35x61, for M. L. Wheeler, to be built on Woodlawn avenue, between 46th and 47th streets; heated by steam; cost, $20,000. He has also just let contracts for the construction of a 3-story and basement flat building, 25x62, for Mrs.

M. F. Kellogg; to be built on Oak, near Vincennes avenue; cost, $10,000. L. G. Hallberg has planned a 4-story factory, 41x168, for the Gilbert & Bennett Manufacturing Company, to be built on West 16th street, near Western avenue; cost, $30,000. He has also designed two 3-story dwellings, to be erected on Huron street, near Lake, by John Mountain; cost, $17,000. He has also designed a $17,000 residence, to be built in the same neighborhood. Alfred Smith has planned a 3-story dwelling, 34x70, to be erected on Ashland avenue, near Harrison street, by Mrs. R. H. Piratzsky; Bedford stone exterior with hardwood interior; a barn will also be built; cost, $20,000. George O. Garnsey has planned a 4-story store, office and hall building, to be built in Pueblo, Colorado, by John Morris & Co.; cost, $40,000. Treat & Foltz have designed a 5-story and basement apartment house for Mrs. Payne, to be built on Walton place, near State street; cost, $15.000. For Dr. J. W. Chew they have planned a 4-story and basement apartment house, 40x88, to be built on Erie street; cost, $23,000. They will also make plans for the Harlem Turner Hall; to cost $25,000. Thomas & Rapp have designed a 3-story residence, 26x80, for O. W. Meysenberg, to be built on Astor street, near Burton place. It will cost $50,000. For Mrs. Long and Mr. Clark they have designed a 2-story front dwelling, to be built on Calumet avenue, near 35th street; cost, $20,000. George Vigeant has designed an additional story, 52x75, to the Marquette Club House; cost, $10,000. For the Bremner bakery he has planned a 3-story stable. For St. Joseph's Church at Marinette, Wis., he has planned a new edifice, to be built of brick and stone; cost, $17,000. L. G. Quackenboss has planned for George H. Frost three 2-story and basement dwellings, to be built on Oak avenue, cost, $25,000. William Olhober has designed a 2-story and basement residence for William Niemann, to be built on Humboldt boulevard, near the park. It will be of stone, with hardwood interior; cost, $10,000. He has also planned for August Bunge a 2-story and basement flat building, to be erected on Walnut street. Perley Hale has planned a 2-story flat building, 48x60, for Payne & Green, to be built at Auburn Park; cost, $12,000.——Philadelphia, Pa.: Plans have been completed for a building to be erected at Mount Airy upon the grounds of the Deaf and Dumb Asylum. It will contain, when completed, all the boilers and engines used in heating the institution. A syndicate of gentlemen, headed by Dr. Strawbridge, of Germantown, are now negotiating for a site, 60x100, in the neighborhood of 13th and Reese streets, upon which a handsome building, especially designed for business offices and light manufacturing purposes, will be erected. New business houses will be erected by Joseph E. Brown and William N. Read. Mr. Brown will build near 13th and Arch streets, and Mr. Read is negotiating for a site on the west side of 7th street, north of Market. John T. Windrim will prepare the drawings for an infirmary, to be be built on the Girard College grounds for 200 beds.——Baltimore, Md.: Baldwin & Pennington, in addition to the Builders' Exchange, have plans for an office building to be erected on the northwest corner of Lexington and Charles streets, for the Fidelity Trust and Deposit Company. To be 100x90, 9-story, built of common brick and stone; cost, $30,000. Charles Cassell has plans for an apartment house to be erected on Mount Vernon place for Dr. Wm. A. Moale. To be 51x129, 9-story, built of common, pressed and ornamental brick, with stone trimmings and terra cotta; cost, $200,000. The same architect has prepared plans for four dwellings to be erected on Charles, north of Chase street, for A. L. Gorter. To be 19.6x80 each, built of common brick, with stone trimmings; cost, $60,000. Alfred Mason has plans for Public School, No. 10. To be 68x103, 1-story, built of pressed brick, granite and stone; cost, $12,000. B. B. Owens had made sketches for an edifice for the Harlem Park M. E. Church. To be 60x100, 2-story, built of common brick, stone exterior; cost, $35,000. The members of the Hanover Street Synagogue contemplate erecting a $150,000 synagogue. Isaac Strouse can give particulars.——Columbus City, Ala.: The Southern Industries Co., of 1 Beacon street, Boston, Mass., will shortly commence the erection of its hotel at Columbus City; it will cost about $20,000.——Atlanta, Ga.: The Atlanta Church Extension Society is reported as to build two churches. H. Mozley will erect a hotel at Lakewood Park; main building to cost from $15,000 to $20,000.——Bunkley, Ga.: The Cumberland Island Co. will enlarge its hotel and make other improvements on its Cumberland Island property at a cost of about $25,000.——West End, Ga.: It is stated that W. M. Goodrich & Co., of Atlanta, have prepared plans for the erection of an edifice, 100x250, for the West End Presbyterian Church; cost, $150,000.——Savannah, Ga.: It is stated that S. Guckenheimer & Son will erect a new building to replace the one recently burned.——Gallatin, Tenn.: The Knights of Pythias contemplate erecting a hall building, to cost $20,000. Prof. B. F. Hooker can give information.

HEATING AND LIGHTING.

The following electric light companies have been recently organized: Leslie Electric Light & Power Co., of Leslie Mich.; for light, heat and power; $10.000. St. Paul Electric Mfg. & Construction Co., of St. Paul, Minn.; Paul Mattin, J. T. Hughes, C. H. Lieman; $100,000. Lander Electric Light & Power Co., of Lander, Wyo.; J. D. Woodruff, E. Amoretti and W. Wallace; $10,000. Ashuelot Valley Electric Lighting, Heating & Power Co., of Winchester, N. H.; Merchants' Electric Light Co., of Leavenworth, Kan.; President, C. M. Salinger; Secretary, J. H. E. Wiegant. Heat, Light & Power Co., of Chicago, Ill.; D. E. Davis, Wm. Barrett and Ernest Kauffmann; $20,000,000. Cataract Electric Co., of Buffalo, N. Y.; C. H. Sweet, F. H. Locke, E. Hayes; $40,000.——Franklin, Va.: An electric light plant is to be put in. For particulars address the Mayor.——Saratoga, N. Y.: The tax-payers have voted in favor of electric lighting for the streets.——Ogden, Utah: The Ogden City Ry. Co. has applied for a franchise for using its wires for electric lighting.——Seattle, Wash.: The joint street light committee, to which was referred the communication of the Board of Public Works, together with bids submitted for lighting the streets for the ensuing year, reported that the city should own and control its own street lights, but could not see how it was possible to do so at present. It therefore recommended that a proposition to bond the city for the necessary funds for that purpose be submitted to the voters at the next general election. The report was adopted.

SEWERAGE NOTES.

Revere, Mass.: The sewer question is much discussed.——Nantucket, Mass.: A survey is being made for a proposed sewerage system.——Goshen, N. Y.: Sewers are proposed.——Sandy Hill, N. Y.: Plans for a sewerage system to cost $60,000, have been presented to the village authorities by Mr. P. H. Baermann, of Troy.——Olean, N. Y.: Plans for a system of sewers will be prepared by the Stanwix Engineering Co., of Rome, N. Y.——Cincinnati, Ohio: Plans have been prepared for numerous additional sewers.——Negaunee, Mich.: A sewer system is projected at an estimated cost of $46,700.——Ogden, Utah.: New sewers will be built at a cost of $17,000.——Phœnix, Ari.: The Arizona Water-Works and Sewerage Co. has been organized by Frank Baxter, H. N. Alexander and J. L. B. Alexander to build sewers under a franchise from the city. Capital stock, $500,000.

WATER WORKS NOTES.

Alton, N. H.: An effort is being made to form a water company.——Bethel, N. H.: Works are projected at a cost of $6,000. Great Falls, N. H.: A question of a new water-works system is being agitated.——Longview, Tex.: Works are still under consideration.——St. Joseph, Mich.: Bonds have been voted for works.——Fairbury, Ill.: An extension of the mains is talked of.——Wyoming, O.: Works to be owned by the village are proposed at an estimated cost of $25,000. Supply, driven wells, by pumping. Hartwell, Lockland and Reading might be supplied in conjunction with Wyoming. R. D. Barney is Mayor.——Linton, Ind.: Works are talked of.——Weston, W. Va.: Works are wanted.——Wheeling, W. Va.: It is reported that $100,000 will be appropriated for new plumbing machinery, and $25,000 for a new station.——Green Cove Springs, Fla.: The following information has been received: The Mutual Water Co. proposes to let contracts in Nov. for works estimated to cost $8,000. It is hoped that sufficient pressure can be obtained from artesian wells. Address J. F. Greed, secretary. Population, 1,500.——Orlando, Fla.: Water-works bonds have been sold at par.——Collinsville, Ala.: Address Beavers & Marsh regarding proposed works.——Glens Falls, N. Y.: An additional supply is being considered at special village meetings.——Mechanicsville, N. Y.: P. H. Baerman, Troy, estimates the cost of works as about $56,000. It is thought that a spe-

cial election will soon be called to vote on the question.——Newburg, N. Y.: A special election will be held to vote on issuing $75,000 bonds, of which $20,000 is desired to buy land, $15,000 to build an open ditch between Washington Lake and Silver Stream and $40,000 to remove stumps and muck from the lake. A new 2,000,000 gall. pump is also proposed.——Saugus, Mass.: An appropriation of $16,500 has been made to extend the mains.——Greenville, Tenn.: It is thought that works will soon be built.——Medicine Lake, Wash.: At an informal meeting of citizens a unanimous vote for works was given. Address C. S. Cadwell or W. I. Dwyer.——Childress, Tex.: G. H. Chipman can give information regarding proposed works.——Flatonia, Tex.: A water-works investigating committee has been appointed. A supply will be sought.——Walden, N. Y.: Bonds for works to the amount of $25,000 have been voted. It is stated that the supply will be pumped from the Wallkill River to a 200,000-gall. stand-pipe and that 2½ miles of street mains will be laid. Power will be furnished by the New York Knife Co.——Egg Harbor City, N. J.: A franchise will probably be granted a company. William Taylor is at the head of the enterprise.

BIDS AND CONTRACTS.

Boston, Mass.: Sealed bids for building Sections 21 and 22 of the Metropolitan Sewerage System in Medford and Section 24 in Everett and Charlestown, in accordance with the form of contract and specifications to be furnished by the Board of Metropolitan Sewerage Commissioners, will be received by said board at its office, 93 Lincoln street, Boston, Mass., until 12 o'clock M. of Wednesday, November 4, 1891. Howard A. Carson is chief engineer.——Fort Worth, Tex.: Several proposals are wanted until November 16, for the construction of a water-works system and furnishing material for same. Address J. P. Smith, Mayor.——McKeesport, Pa.; Proposals are wanted until November 5, for furnishing, etc., two 3,000,000 gallons horizontal duplex direct-acting, compound condensing, a non-compound condensing, rotative pumping engines of the outside center packed water plunger pattern. Address Jos. Ecoff, Waterworks Superintendent, as above.——Henrietta, Tex.: H. J. Strickfadden, City Secretary, wants bids for a complete system of water-works, an electric light plant and an ice plant. No date specified.——Brownwood Tex.: The Brownwood National Bank wants bids for the erection of a bank building. Hon. J. Bair is President. No date specified.——Victoria, Tex.: E. A. Perrenot, Clerk of Victoria County, will receive bids until November 3, for the erection and completion of a 3-story court-house.——Washington, D. C.: Proposals are wanted until November 2, for the erection of a building at Mare Island, Cal. Address J. Mills Browne, Surgeon-General, Bureau of Medicine and Surgery.——Albion, N. Y.: Proposals are wanted until October 31, for the erection of a House of Refuge building. Address E. K. Hart, President of the Board of Managers of the Western House of Refuge for Women.——Beardstown, Ill.: Proposals are wanted until November 2, for the construction of a system of water-works at this place. Address H. M. Schmoldt, Chairman Committee on Water-works.

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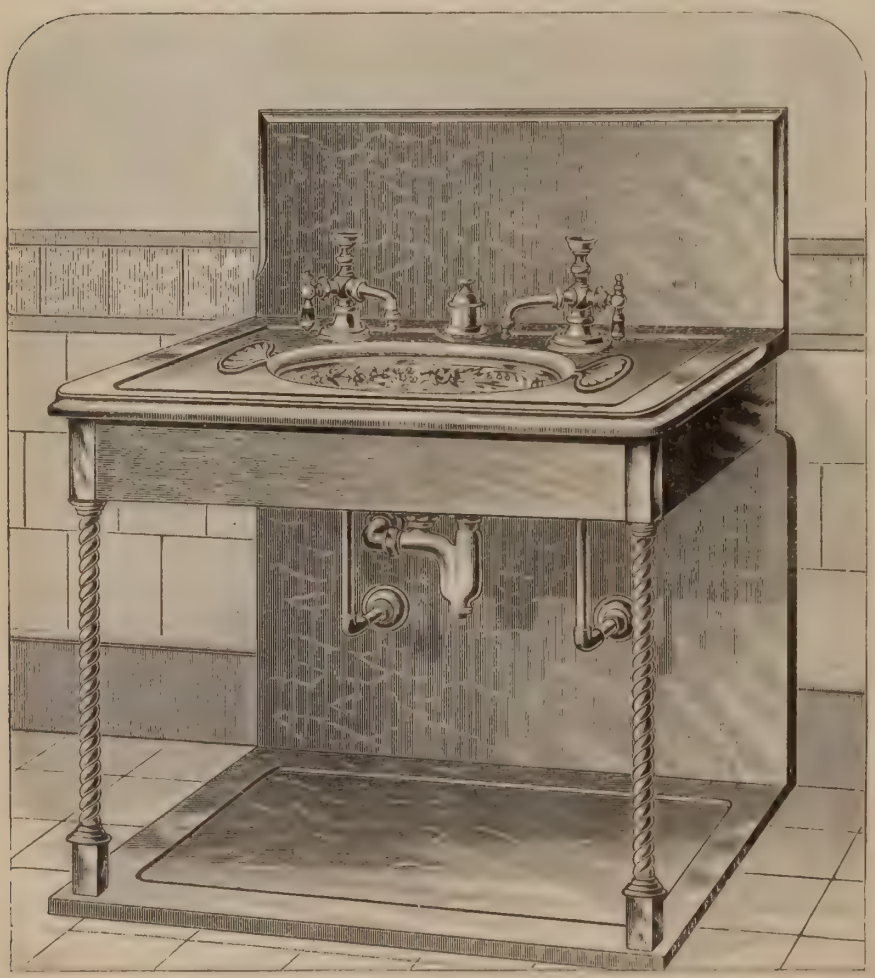
No. 4.



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COMMUNICATIONS.

Address all communications to The Sanitary News, 90 La Salle Street.

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The nineteenth annual convention of the American Public Health Association that assembled in Kansas City October 20th to the 23d, was a representation of a large and respectable portion of men. They have for their work that which touches man's highest interests. Sanitarians, they go from their homes in the East to the place of meeting away in the West, in order that they may do their share in the upbuilding of the great public association. Many profitable papers were read during the convention by men well qualified in the class to which they contributed. The next meeting will be held in the City of Mexico in 1892, and the following officers were elected for the current year: President, Dr. Felix Fermento, of Louisiana; first vice-president, Dr. Domingo Orvananos, of Mexico; second vice-president, Dr. Walter Wyman, of Washington; secretary, Dr. Irving A. Watson, of Concord, N. H., and treasurer Dr. J. Berrien Lindsley, of Nashville, Tenn., held over. The advisory committee recommended the following resolution which was passed:

Resolved, That this association will hold its meeting in 1893 in the city of Chicago, and that, so far as possible, the occasion be made an international congress of hygiene and public health. Thus did they settle the places for meeting for two years.

* * *

From the South Bend *Morning Post* we learn that diphtheria is in a school building above the school, which is on the lower floor, the diphtheria being in a private family above. The Board of Health have posted the family with the diphtheria, and announce that is all that is necessary. "I don't believe it is necessary to close a school only in cases where children who have been exposed are in attendance," is what the secretary of the Board of Health says. The nature of diphtheria is such that it could hardly be kept in one room or the rooms occupied by that private family. There are on record cases of diphtheria spreading more than from one room to another in the same house. It is a very insidious disease and has been taken far more than one floor to another. It is on record as spreading throughout cities and even through the country. Whatever may be the cause of this decision of the South Bend Board of Health, it seems to us that about the best conditions there exist for the spread of the disease known through the school; we could in no way consider it a safe place for children to go. A little thing might bring one scholar in contact with it and that would spread an epidemic of the disease. We do not see how the school can be kept running and the diphtheria kept out of it. Better close the school by far than to take the chances of having the diphtheria become epidemic. There may be some chance of the school remaining free from the disease, but the wisest thing would certainly be to close the school.

* * *

It seems as if Philip Andrews, the new sanitary commissioner of Omaha, has, in accordance with the Omaha *Bee*, had some affairs to straighten out which were difficult to get his official duties into good running order. Prior to his taking charge it seems as if the duties of that office were run in almost any manner as would best suit those who should have been more active in sanitary matters. The citizens seem to have become ignorant of sanitary ordinances and disinclined to recognize the authority of any one to enforce them. The following from Mr. Andrews is suggestive for other cities than Omaha:

"All measures of reform, in any direction, often meet with decided opposition from parties who imagine that their privileges and rights are infringed upon by the enforcement of such measures. Nothing will aggravate the common mortal more than the enforcement of what he is pleased to term "arbitrary" measures; no matter whether the community will be benefited thereby or not, he is loth to give up his way of doing things, his custom of yore.

"In no department of municipal government is this opposition more manifest than in that of sanitation. A good deal of this opposition is due to the fact that the citizens are not enlightened on the subject and have only an imperfect knowledge of the law. I have been trying to systemize the sanitary work of the city as near as can be done, under our present ordinance, to bring about the best results. In this undertaking I have had the support of the honorable City Council, as well as the Board of Health, and the police force. In only a few cases was I compelled to invoke the aid of the police court. When once the intent of the law is properly understood, a better and more rigid enforcement will be at-

tained. A thorough system of sanitation can only be inaugurated and maintained when we will have done away with the 'fee system' for hauling garbage and refuse; when the same has become a city charge, and the expenses are defrayed in the manner of other departments of this city."

* * *

We learn from ex-President Robert Griffith that the death of President Joseph A. Macdonald was not expected until Friday and that he died Sunday. He died of some stomach trouble, for which he had taken a little recreation and returned home. When the seriousness of his complaint became apparent he was taken to the hospital with which his son was connected, as the means of better treatment. It was found the means of saving his life lay in an operation and that he was too weak to stand it. The disease had been slowly pulling him down for some time, but he was not known to be dangerous until he was taken to the hospital. This takes away one of the best men for president, as we do not suppose there are any others who would feel as able as he. He was just getting everything in order and would have presented strength through the year. But he was called from his labors, and he has thrown his load on the shoulders of another. We trust he will be able to take up the load and carry it forward energetically and enthusiastically.

THE SECRET OF YOUTH.

A contemporary writing of the secret of youth says: People are apt to attribute haggard looks to mental activity, and to counsel repose and tranquility as a cosmetic.

To the thoughtful traveler, the falsity of this theory is obvious. It is in the country village, where the church meeting is the theater, the mail the excitement, the days weeks, and one can hear the cows breathe in the deathly stillness that the greatest number of sunken cheeks, wrinkled brows, leaden complexions, and lifeless expressions are to be seen among the women yet in their thirties. In the seething metropolis, living three lives and enjoying two, are to be found scores of women—mothers or perhaps grandmothers—possessing all the vitality, freshness, and much of the bloom of early youth.

The fact is, says a writer in the New York *World*, it is not activity, but drowsiness, the presence of sleeping or dead thought in the soul that is aging. Unvaried scenes, the repetition to-morrow of to-day, to-day of yesterday, this week of the preceding one, the ability to calculate exactly what each neighbor is doing at each hour of the day—the inevitable clock-like routine of conception, the monotony of existence, the utter weariness of an empty think-tank, that saps the vernal springs of life and creates decay in the face.

Past grief, old angers, revenges, even past pleasures constantly dwelt upon—all dead, decaying, or decayed thought—make a sepulchre of the soul, a cemetery of the body, and a weather-beaten monument of the face. This is age.

The women who never grow old are the student women—those who daily drink in new chyle through memorizing, thoroughly analyzing, and perfectly assimilating subjects apart from themselves. Study is development—is eternal youth. The student woman who makes wise use of her acquisitions has no time to corrugate her brow with dread thought of the beauty-destroyer leaping fast behind her. Not considered nor invited, Old Age keeps his distance.

Brain culture, based on noble motive, means sympathy, heart gentleness, charity, graciousness, enlargement of sense, feeling, power.

Such a being cannot become a fossil. She has found the elixir of life, the fountain of eternal youth.

There is no doubt that the culture of the mind is helpful in continuing the youthful face. It may not be under all circumstances, but in the majority of the cases it will have a tendency toward freshness, the enjoyment of life enlarged and the growth of soul and body together. The culture of the mind does not mean a routine of books or close study, making life know nothing but what is found in books. It means the enjoyment of study, the thorough assimilation of whatever comes up in life throughout the existence. If one were simply to sit down and study books, and not to go out and study nature, and breathe the air with the full enjoyment and satisfaction of having it to breathe, these writers might have another phase of the case to present. There is the condition of mind which enjoys itself, which is of such existence that it is always wide awake, full of life, and so contented that it is always young. This kind of a mind can be acquired if one has the misfortune to be without it. Study to become cheerful whatever may surround you, and you will be well on the road to good health. The body takes after the mind and the mind is influenced by what is put before it. Let this be healthful to it, something that will build it up, and the effects on the body will well repay all the trouble.

NEWS AND NOTES.

Hot water taken freely half an hour before bedtime is helpful in the case of constipation, and has a most soothing effect upon the stomach.

At the sluices near Malgrange, according to M. Cuony, ground ice forms about the iron work largely used in the sluices, and is got rid of by heating the upper part of the structure with wood fires. M. Cuony produced ground ice experimentally, by cooling an iron bar 10 to 15 deg. below zero C., and plunging it in cold water, thus illustrating the part played by the piles of bridges.

Mr. S. P. Sticker, an engineer, of Buffalo, N. Y., claims to have discovered a method of making ice by means of illuminating gas, which may be returned to the mains after use without deterioration. By experiments in the works of the Provincial Gas Co., at International Bridge, Ontario, he produced a temperature of 80 deg. below zero by the use of water and gas only, without chemicals.

A large filter of 1,250,000 gallons daily capacity was recently tested and accepted by the city authorities of Philadelphia for supplying the new city hall with water. The filter is over 20 feet in diameter, is about 12 feet high, and was tested under a pressure of 125 pounds for forty-eight hours. It is on the National system, but differs from the usual form, in being more rigidly braced within by solid stays.

If it were possible for man to construct a globe 800 feet in diameter, or, say twice the height of St. Paul's Cathedral and to place upon any part of its surface an atom one-four thousand three hundred and eightieths of an inch in diameter and one one-hundred and twentieth of an inch in height, it would correctly denote the proportion man bears to the earth upon which he stands.

The marble tower of the Philadelphia city hall, which rises to a height of 337 feet 4½ inches above the pavement of the courtyard, is to be surmounted by a clock story of iron, 67 feet 8 inches, and this by a pyramidal dome of aluminium, 105 feet 7 inches high, the whole capped by a bronze figure of William Penn, 37 feet tall. The iron clock story is finished and set up on the grounds of the Tacony Iron and Metal Company, at Tacony, Pa. The figure of Penn, which is being cast in sections, is also nearly completed.

The United States Department of Agriculture, through the Forestry Division, has commenced an elaborate investigation of the physical properties of American timbers as related to their conditions of growth, and the uses to which they are put. These examinations and tests are to be made on all the commercially useful timbers selected from all parts of the country, and on commercial sizes up to the largest beams ever used, and will prove of value to engineers, architects, builders, railroads, lumber manufacturers and dealers, and to the public generally. They will extend over a series of years, but the results will be made public as fast as obtained. The investigations are being made at the Botanical Laboratory of the University of Michigan, at Ann Arbor, and at the St. Louis Test Laboratory in charge of Prof. J. B. Johnson.

The Austrian Government proposes to shortly take in hand the great public works contemplated for some time. These comprise the construction of the city railway, the making of the channel for, and bridging the river Wien, the adaptation of the Danube canal for extended purposes of navigation, the reconstruction of the whole system of drainage in Vienna, and the extension of the aqueducts. The capital which is required for these works amounts to nearly $45,000,000.

The consumption of water in twenty-three German cities, having a population of over 100,000, is stated in a recent number of

Schilling's Journal for gas lighting and water supply, to have averaged about 26 gallons per capita daily. Although this amount seems very small to American engineers, it is still further reduced if the data for Hamburg are omitted, becoming 21½ gallons per capita. Hamburg, with approximately half a million inhabitants, consumed in the last year 42,000,000 cubic meters of water, or 7,000,000 meters more than Berlin, a city of about three times its size.

DRAINAGE OF CITIES AND ITS RELATION TO PUBLIC HEALTH.

BY HUBBARD W. MITCHELL, M. D., IN MEDICAL RECORD.

The subject of the drainage of cities includes in its more comprehensive sense the kindred subject of sewerage, and the no less important subject of cleansing of the streets and public ways.

All these three points—drainage, sewerage and street cleaning—are so important and so closely allied as to form practically but a single head in the great question of public health. The neglect of these in past ages gives us a long list of mournful experiences in the plagues, pestilences and epidemics that have so often and so frightfully scourged mankind.

If we glance backward along the line of history we find that some of the fairest provinces of the earth have been fearfully afflicted with the ravages of disease, and often whole communities have been swept away or decimated by the invasion of epidemics that owe their existence and spread to the ignorance and disregard of sanitary laws.

Men learn the lessons of sanitary rules slowly, and this is but too often seen in the appearance of loathsome and contagious ills that every now and then stalk among us like a hated specter.

When men aggregate in large numbers within restricted limits, a condition of things at once arises that makes imperative the observance of certain laws to regulate their well-being, and these laws cannot be disregarded without our paying a fearful penalty of sickness, suffering and death.

This aggregation of great numbers of individuals within restricted areas, as in cities and towns, and the maintenance of the public health of these masses of individuals in relation to drainage and sewerage, and the proper condition of cleanliness of its streets and public ways, present a sanitary problem at once complex and difficult.

The waste matters of the human body, and of the bodies of the various domesticated animals domiciled among us, and the large amount of garbage from our cellars and kitchens, make it very important that we should get rid of these waste matters in a way that will not affect the general health. It has always been a matter of the greatest difficulty to determine the best way of getting rid of these waste matters of the body, which pass into the sewers and thence away from the place from which they are discharged. The drainage of cities has been a problem that has enlisted the best talents of engineers and sanitarians. The system of sewerage in large cities is therefore a very important matter, and it has elicited a large degree of engineering skill to devise the best method of constructing these important outlets. No less important is the matter of getting rid of the great amount of garbage which daily accumulates in all large cities and towns. Many of the diseases which afflict the human race have been generated through the decay and putrefaction of these substances which are indiscriminately thrown into the streets and gutters; the sun pouring down upon them and the moisture of the rain has set up the process of decomposition, and this has given rise to disease germs which enter the human body and excite into activity a multitude of loathsome and painful ills.

In reviewing the history of the world, we find that in all ages where a plague or pestilence has arisen the causes of these can be traced to bad drainage and to the decay of garbage and other waste matters which are thrown into the streets. Bad drainage is one of the most fruitful sources of disease. The waste matters which are poured constantly into the sinks and cesspools not being properly carried off, and the places themselves not properly cleansed, have given rise to the process of putrefaction and to a long list of maladies. In tropical cities, where the drainage has been imperfect, and in some places where no drainage has existed at all, periodical epidemics have occurred with frightful regularity and with fatal results. The great plague which visited the city of Florence, Italy, in the fourteenth century, was caused by the imperfect drainage of that city—in fact, drainage was almost unknown, and all of the effete matters of the city were allowed to collect in cesspools or run upon the ground, and under the hot sun gave rise to putrefying gases and disease germs.

The epidemic of cholera which swept over a large part of Asia and Europe almost annually until recently, was the result in a great measure of imperfect drainage and a gross neglect of sanitary laws. In the superstition of those times they were attributed to visitations of Divine displeasure, and the shrine-cure and the miraculous interposition of saints and others were invoked for their relief, but in spite of these the disease continued its ravages until a more enlightened age pointed out the cause and remedied the defect.

In the city of Rio Janiero the yellow fever which almost annually scourged that city was found to have its origin in the imperfect drainage of the city and the gross neglect of sanitary laws relating to sinks and cesspools, and the overflow of these upon the adjacent lands was one of the great causes of the production of that dreaded disease. When finally a scientific system of sewers was constructed and the drainage of the city properly carried out, and a stop put to the practice of throwing all manner of garbage into the streets, the epidemic gradually abated.

The city of Panama underwent a similar experience.

Prior to the year 1863 the city of Acapulco, in Mexico, was almost annually visited by yellow fever, and so fatal were its ravages that in some years the dead were left for a time unburied. About this time I had occasion to visit that city, and my opinion was asked, with that of other American physicians, of the cause of these annual scourges. A superficial examination revealed the fact that where sewers existed at all, which were comparatively few in number, they emptied their contents into a swamp a short distance back from the city. Where no sewers existed, and this was generally the case in the town, the waste matters from the houses were poured into cesspools which were contiguous to the wells which were used for drinking water. These wells were frequently polluted by the contents of the cesspools percolating through the soil, and this, with the imperfect drainage and the practice of throwing garbage into the streets, was the cause of the yearly visitation of yellow fever. It was suggested by myself and others that a sewer be constructed which would carry the waste matters of the city into the Pacific Ocean, and the authorities lost no time in acting upon this suggestion. Since then yellow fever has visited Acapulco but rarely, and then only in a mild form.

The city of New Orleans was almost annually visited by yellow fever before General Butler reconstructed the levees and the drains of the city, and caused the streets to be daily flushed with a supply of pure water.

The city of Memphis affords another striking example of the effects of bad drainage. The case of Memphis is closely analogous to that of Acapulco. The sewers were badly constructed and poured their contents into a bayou in the rear of the city. The cesspools here also were contiguous to the wells of drinking-water and here again the contents of the cesspools percolated through the soil and poisoned the waters of the wells. To add to this, the garbage of the houses were thrown indiscriminately into the streets, and these causes acting together gave rise to yellow fever, which was so severe and so fatal in that city for many years. When modern science came in and constructed a proper system of sewers, and the drainage of the city was intelligently and properly carried out, Memphis became rid of her annual scourge.

In some of the newer cities of the West, the sanitary engineers have constructed things better. In the city of Denver, which lies at a mean altitude of 5,200 feet above sea level, and is, during the summer months, scorched by severe heat, the maintenance of the public health is kept up by a practice of daily flushing the streets through a system of irrigation furnished by the waters of the South Platte River. From this stream, which heads in the Rocky Mountains near by, a copious supply of water is led through nearly all the streets of the city, and the gutters are kept sweet and clean. From the same source the sewers are daily flushed, and this great sanitary measure is one reason why Denver is regarded as a health resort. Salt Lake City is likewise preserved in a similar manner. The sewers of this city are comparatively small, but a boundless

supply of pure cold water is obtained from the melting snows of the adjacent Wasatch range of mountains, and this flood is poured copiously through every street of the city, and in this way the health of the city is maintained.

In the city of New York the sewers, in a large measure, are ample and well constructed, yet many of them are in a dilapidated condition. This is the fault of the authorities who have this matter in charge. Our city should be the best drained city in the world. Its configuration is such that it can be easily drained into the two great rivers which bathe its shores. In many cases, however, the sewers are sadly out of repair, and their contents are allowed to escape into the surrounding soil, saturating it with their vile contents, and whenever the streets are opened for the purpose of repairs the foul and offensive gases escape into the air. These defects are being gradually remedied, and under the intelligent vigilance of the Board of Health the sewers are being constructed in a more thorough and more permanent manner. The subject of sewer-gas has perhaps been incorrectly stated, and its importance somewhat overestimated. It is a current belief in the public mind that the gas in the sewers is under a strong pressure, and through any leak in the sewers or waste pipes this gas is strongly forced backward into the houses. This is not altogether true. Experiments have been made by the Board of Health and by the authorities of Columbia College to show what amount of pressure of sewer-gas existed in the sewers, and these experiments have demonstrated the fact that this pressure is inconsiderable. Even where the mouths of the sewers have been exposed above the water-mark, and where the wind has blown with considerable force into them, this has not exerted as great an amount of pressure as one would naturally expect to find.

The system of ventilating pipes in houses leading from the basement to the roof is of great value. No modern house is constructed without a ventilating pipe, and these carry off the noxious vapors and discharge them in the air at a considerable height above our roofs, practically placing the danger line out of our reach. This system of ventilating pipes, and the ventilating shaft now constructed from closets, largely obviate the danger to health which formerly existed.

(Concluded next week.)

UTILIZATION OF SEWAGE.

The *Contract Journal* of London, England, states that the Board of Hoghton-le-Spring has decided to adopt a system of sewage utilization recommended by Mr. D. Balfour, M. Inst., C. E.

The process consists in first mixing the sewage in large tanks (in duplicate) with alumino-ferric, a cheap chemical which contains 46.7 per cent. of sulphite of alumina, which is suspended in iron baskets or cages immersed in the sewage to admit of the necessary proportions being dissolved to effect precipitation. It does not, like a large number of chemicals, require any machinery, or add any bulk to the sludge, being entirely soluble in water. It exercises a deodorizing effect, and is not liable, being a neutral salt, to refermentation. The clarified sewerage is then passed on to 10 acres of loam land laid out for intermittent filtration, which consists in forming the land into half acre beds, broad ridged and furrowed and hoed in regular rotation, and having special under drainage with ventilation shafts from which with regular and systematic management, the effluent will pass in a colorless and inodorous state. As sufficient suitable land could not be obtained, this chemical precipitation process was conjoined with the available limited land for the purpose of chemically precipitating and deodorizing the solid matter as much as possible before applying the sewage to the land. Various succulent crops, including vegetables and osiers, are grown on the ridges, the sewage filling the furrows. The scheme was approved by the local government board, and the contract for carrying it out has been let by the local board of health to Mr. John Carrick, contractor, Durham, under the superintendence of the engineer.

SEWAGE PRECIPITATION.

RICHMOND, ENGLAND, MAIN DRAINAGE WORKS DESCRIBED.

The *Evening Bulletin*, of Providence, R. I., describes the sewage precipitation of Richmond, England, as follows:

The statement that the city of Providence, after having adopted a plan of disposing of its sewage by precipitation, was about to abandon that essential element of safety and turn the foul flood into the stream, to continue and ever to increase the present contamination, has attracted general attention. This decision is directly contrary to the opinion and advice of persons competent to express judgment upon such matters, and to the present practice in densely populated localities abroad where the same conditions govern. The untreated sewage caused so great an injury to the port of Southampton that the Royal Yacht Squadron determined to remove its headquarters unless the nuisance was abated. The treatment of the sewage in precipitation tanks purified the effluent, the fish came back into the harbor, the yachting and commercial interests were satisfied, and the sales of the sludge from the precipitation tanks, which found a ready market as a manurial agent, more than pays for the operation of the works.

That the citizens of Providence may see how great a departure is being made from the current practice abroad, and how grave a mistake is involved in the abandonment of the precipitation treatment of the sewage, the new works just constructed at Richmond, England, for preventing the pollution of the River Thames are described at some length. The works receive and treat the sewage of the parishes of Richmond, Barnes, Mortlake, Kew and Petersham. The sewage from all these places has hitherto been partly discharged in its crude state directly into the Thames, greatly polluting its water, and partly retained in cesspools connected to the houses, to the serious detriment of the health of the inhabitants. The five parishes have an area of 12 7 square miles, about one-fifth less than the area of Providence; their ratable value is about $1,500,000, and their population 41,548. They comprise residental districts, and some large uninhabited tracts, which also do not appear in the valuation. Half the area of 1,210 acres of the parish of Richmond consists of Royal Park and other Crown lands. The danger involved in the turning of untreated sewage into the stream was noted as early as the passage of the Thames Conservancy act of 1867. The parishes which have now united in this work at Richmond were divided into the Urban Sanitary Authority and the Richmond Rural Sanitary Authority, and between these two bodies, and opposition to various schemes as they were presented, 10 years were spent to no purpose. In 1877 a provisional order for the constitution of the Lower Thames Valley Main Sewerage Board was obtained. This contemplated a union of interests of nine urban and two rural sanitary authorities, and a total area of 40 suqare miles, extending upon both the Middlesex and Surrey sides of the Thames. This Board survived eight years; it discussed many schemes for dealing with the difficulty, and itself produced three. The Board had spent over $220,000 during its brief life, had done nothing of oonsequence, and the parishes were applying to be separated from the Board. The Board was dissolved by act of parliament in July, 1885, and it is stated that since that time all the constituent authorities who were combined in the joint Board have either completed or in active progress the necessary works for dealing with the sewage of their respective districts in their own localities, either singly or in combination with some adjoining parishes.

In 1885 the first movement for a joint Board for these five districts with a single works was set on foot, the organization was approved by parliament in 1887, and in August, 1888, the construction of the works was begun. Three full years were occupied in the work, unforeseen difficulties having delayed the construction, but they were opened for service on the 28th ult. The works provide each of the parishes of Barnes, Kew and Petersham with an outlet into which it can discharge its sewage matter, the outlets being placed at a sufficiently low level to drain the whole district. In like manner Richmond and Mortlake have been provided with several such outlets for the reception of their sewerage, and for diverting its flow from the River Thames. These outlets for the five parishes are connected together by main intercepting sewers which have been constructed by the main sewerage Board. These sewers vary in size from 12 inches diameter up to 40 inches in diameter. They are all circular in form and are constructed according to the situation of stoneward socket pipes, laid in and surrounded with Portland cement concrete, cast-iron pipes also laid in Portland cement concrete and Portland cement concrete sewers lined with radiating Staffordshire blue brick inverts, and gault brick arches. The sewers all have good self-cleansing gradients, varying from 1 in 250 for the smallest sewer, to 1 in 1,200 for the

largest. The total length of main intercepting sewers is a little under five miles, the depth below the surface varying from 20 to 45 feet. With the exception of two short lengths, the sewers have been constructed in tunnel driven in the London clay, shafts being sunk through the gravel into the clay, which shafts were eventually used for manholes and lampholes. Flushing is provided for where required by the admission of Thames river water at the points where the sewers begin, and by penstocks placed in the sewers. The sizes of the sewers have been calculated upon the hypothesis of excluding from them as much rainfall and subsoil water as practicable, and they are only intended to receive a limited quantity of such waters in addition to the sewage proper. They are capable of conveying the sewage from a population of 80,000 persons, which is the estimated future population of the entire combined districts, one-half to pass in six hours. The outfall sewer has a discharging capacity equal to 11,000,000 gallons in 24 hours.

The sewage will flow by gravitation to the spot situated on the edge of the River Thames, in the parish of Mortlake, where the invert of the outfall sewer and pump chamber is 25 feet below ordnance datum. The topographical maps in England are all compiled by the ordnance office, and "ordnance datum" is thus the point from which elevations and depressions are measured. To this level the whole of the sewage for a district five miles long will flow. The dry weather flow of sewage from the present population is estimated at 2,500,000 gallons per day, and the wet weather flow at 5,750,000 gallons per day. The site obtained for the pumping station and disposal works comprises 11 acres, of which about seven acres only are yet brought into use, the remainder being reserved for the extension of works, to meet the increase of population. The foundation for all the buildings had to be obtained at a considerable depth below the natural surface of the site. The location was therefore not only an expensive one to adapt to the purpose, but also a very large expenditure was necessary in building the foundations and work below ground. Those parts of the pumping station, precipitation and disposal works which it would be impracticable to enlarge have been constructed of sufficient capacity for the entire future population; the other parts, which are capable of easy enlargement, one of a size for dealing with a population about 50 per cent. more than the present.

When the sewage reaches the works through the last length of the sewer, it passes through a strainer made of iron rods into the pump chamber. In this chamber are three sets of single-acting plunger pumps designed for lifts of 43 feet. They are driven by three 50-horse power compound, horizontal, compound, intermediate receiver, condensing engines. Three sets of pumps and engines were installed, but there is room for five. Each set of pumps, with its engine, is capable of raising about 4,000,000 gallons of sewage in a day, the three together being therefore capable of dealing with 12,000,000 gallons per day. Each set of pumps can be worked separately, one of them being sufficient for dry weather, a second set being brought into use in wet weather, while the third is held in reserve in case of accident to either of the others. When the sewage rises to a certain height in the sewers and pump chamber, the fact is communicated by an automatic arrangement of electric bells to the foreman's residence and to the engine-room. The strained sewage flows continuously into the pump chamber, where it receives a small dose of milk of lime from the vats in one of the chemical mixing rooms. It is then pumped to the surface, the operation of pumping also serving to thoroughly mix the sewage and the milk of lime together. The partially treated sewage then flows from the delivery pipes of the pumps by a covered channel into the inlet channel for treated sewage. At the head of the channel is a close iron bar strainer, which removes any large matter that may have passed the first strainer. On its way to the channel the sewage passes through the second chemical mixing room, where it receives a dose of a solution of sulphate of alumina, carbon and iron, and is thoroughly mixed therewith by an agitator. The channel is then carried upon arches to the tanks. The precipitation tanks are 11 in number, with an aggregate capacity of 1,210,000 gallons. The treated sewage is admitted continuously into one or more of the precipitation tanks as required. As the tanks fill, precipitation takes place, the precipitates falling rapidly to the bottom, while the effluent water, now deprived of the whole of its polluting matter in suspension, and nearly all of that in solution, flows continuously over weirs at the other end of the tanks. This effluent water is sufficiently pure to be discharged direct into the river, and can be passed thereto by an outlet at one corner of the works. The effluent water is, however, raised to a higher degree of purity whenever required by filtration through filter beds, constructed of layers of various sized gravel, sand and carbon, the surfaces being covered with a thin layer of agricultural earth sown with grass. The four high level filter beds have an area of an acre, and the four low level beds an area of one-half acre. The pre-precipitation tanks are emptied of their entire contents once a day, and when a tank has to be emptied it is shut off from the inlet channel for treated sewage by valves, and allowed a short time for repose. The water is then drawn off from the tank by a floating pipe, the upper portion of the water being discharged on to the high level filter beds, and the lower portion on to the low level filter beds. The discharge from both filter beds will flow into the Thames by gravity, except for a short time at spring tides, when the river is also filled with land water.

The precipitate commonly called "sludge" at the bottom of the tank averages from two to three inches deep, being nearly all or 90 per cent. water. The water drawn off from the tanks and passed away to the filters or to the river direct, is not, however, lowered quite down to the precipitate or sludge, the water immediately overlying the sludge for 6 or 7 inches, being retained with the sludge, The bottoms of the tanks slope at 1 to 60, so as to form channels and the sludge and the water last mentioned run together, aided by sweeping into a covered sludge passage from which the matter passes into the sludge chamber beneath the press-house. In this sludge chamber precipitations still rapidly takes place and the water which rises to the top of the sludge is drawn off by a floating pipe. It is not, however, allowed to pass the filter beds, in the river, but flows back into the pump chamber, mixes with the sewage, and is treated over again. The quantity of water thus dealt with is comparatively very small. The sludge, having thus been deprived of some of its water and brought into a favorable condition for pressing, is lifted by pumps into iron receivers, placed in the press-house.

These receivers each contain a charge for one press. In these it is limed, that is, a certain quantity of lime is added to it so as to facilitate the operation of pressing, and it is forced by rams into the presses. The water pressed out of it, again a comparatively small quantity passes to the pump chamber and mixes with the sewage, to be treated over again, and the solid sludge cakes measuring 3 ft. square by 1½ ins. in thickness, are removed from the presses. These presses are 36 in. square, each containing 30 plates and chambers. Sludge in its pressed condition occasions no nuisance whatever, and may be stacked and stored without creating any annoyance. For agricultural purposes it has a manurial value rather higher than that of the best farmyard manure. The quantity that will be produced from the less than 42,000 population at present resident in the district is about 10 tons daily, and the demand from the market gardens assures its advantageous disposal. The entire cost of the works, including the sewers, will amount to between $575,000 and $600,000, and the annual cost of carrying on the work, including the pumping of sewage, is estimated at $17,400.

CONVENIENT TO HAVE ABOUT.

Steam pipes are now made of ramie fiber and the material is pressed so closely together by means of hydraulic machinery, that it has a tensile strength two and one-half times that of steel.

The work of replacing a broken pane of glass may be greatly simplified by running a hot iron around the old putty, which loosens it, when it may be easily scraped off, and the broken pane removed.

Recent studies of this disease show that it is sometimes contagious, or, at any rate, that there is a form of contagious or infectious jaundice which apparently attacks several persons almost simultaneously, and spreads with considerable rapidity.

According to M. W. Smith Lea, in the columns of a German paper, a mixture of 50 to 65 per cent. of granite or syenite, 5 to 15 per cent. of blast-furnace slag, 15 of clay, 5 sand, 5 phosphate of potash, 5 of common salt, and 2 of chalk, all finely powdered and

mixed, makes a cement or mortar which will resist exceedingly high temperature.

Caoutchouc can be dissolved more readily by adding from 5 to 15 per cent. of oil eucalyptus to the benzol or carbon bisulphide used; in the latter proportions, the mixture of carbon bisulphide will dissolve nearly 20 per cent. of caoutchouc.

Deoxidized bronze is another alloy resembling phosphorbronze. It is made of 82.68 parts of copper, 14.4 tin, 3.23 of zinc, 2.14 of lead, .1 of iron, .07 of silver, and .005 of phosphorous. It is used in wood-pulp digesters, as it resists the action of sulphurous acid and sodium hyposulphite well. Wire made of this alloy has a tensile strength of 150,000 pounds per square inch—*The Iron Industry Gazette.*

Oak may be given the appearance of age by sponging with sulphuric acid and water equal parts, or what is preferable, staining with umber in thin shellac varnish. Iron work may be treated with a wash of sulphate of soda and heating over a fire, or by brushing a solution of flour of sulphur in ten parts of turpentine, dissolved by heating over the irons, then holding them over an alcohol lamp; heat until the black polish appears.

V. L. Daguzau says of the new cement which is attracting great attention in England: "This material is called by the inventor pyro-cement, and is "a blackish product, which adheres strongly to iron, wood, stone, etc." The following constituents and proportions yield a useful result: "18 to 25 per cent. of gas petroleum or other resinous matters, 75 to 80 per cent. of clay or argillaceous earth and silica, 2 to 8 per cent. of natural sulphates."

To fasten glass letters, figures, etc., on glass (show windows) so that, even when submerged in water for several days, they will not become detached, use an Indian rubber cement. The best for this purpose consists of one part India rubber, three parts of mastic and fifty parts chloroform. Let it stand for several days at a low temperature to dissolve the cement. It must be applied very rapidly, as it becomes thick very soon.

A German physician, who has been experimenting upon himself, recommends sauer-kraut as the best remedy for nervous dyspepsia. One can hardly imagine how so nauseous and indigestible an article could be beneficial to a disordered stomach under any circumstances, unless it be upon the principle which one bacteriologist has suggested as being available as a method of combating disease; namely, that one set, or class of germs may be destroyed or driven away by another set. The symptoms of nervous dyspepsia are well known to be due to the development of microbes in the stomach, and to the poisons formed thereby. It is quite possible that the germs of sauer-kraut are so much more virulent, or active, in character, that they are able to subdue and oust from their pre-empted territory the mischief-making germs which are present in this form of stomach disease.—*Good Health.*

IS THE APPRENTICESHIP IDEA WORTH PRESERVING?

We find in an English representative hardware journal, says the *American Artisan*, some interesting remarks upon the subject of apprenticeship from which we gather that, as with ourselves, the old system of binding a youth for a long term of years in order that he may become a duly qualified workman or tradesman is less practiced in England at the present time than it was in former years. Our contemporary is not willing to admit that this is the case in the hardware trade, although acknowledging that the term of service of apprentices has been materially shortened even in that line of business. Our English contemporary refers to the "good old times;" when it was considered essential that a youth having "finished school" should look about for some genial occupation, and having found it should be duly bound by attaching his signature to a formidable parchment, for a term of seven years to his employer. This term has now been shortened to five years, and in some cases to three years, a fact which induces the English journal to express the belief that "no youth can possibly learn the multifarious intricacies of the ironmongery trade in three years—indeed," it regretfully adds, "there are many, unfortunately, who come to the end of the full seven years without having a more than sadly imperfect knowledge of the trade."

The English people are intensely conservative in their views and are in the habit of sticking to their old customs and traditions with as much tenacity as an ivy plant does to a church ruin; it is not to be wondered, therefore, that the shadow of the passing of the apprenticeship system, a practice handed down from a time beyond which the memory of man goeth not, should awaken comment. While we may be inclined to indulge in occasional pleasantry at the old-fashioned ways of our cousins over the water, there is no denying the fact that a system which assures to a boy a thorough training under wholesome influences during the years when he is most susceptible to good or evil ascendencies, is one which it would be almost a national misfortune to see swept away. It is an acknowledged fact the world over that men who have faithfully served out their terms of apprenticeship under the English system are almost without exception competent workers, whether as handicraftsmen or as tradesmen. Having learned thoroughly a certain trade they are content to devote their lives to it, and so the knowledge acquired during the long term of apprenticeship serves as a foundation, we may say, upon which their industrial lives are built. As the trade paper upon whose reference to the subject these remarks are based truly says, while deploring the possible abandonment of the system of binding youths to an employer by means of indentures of apprenticeship: "In the absence of the apprenticeship agreement there would certainly be constant changes on the part of the young men, who would become 'jacks-of-all trades and masters of none.'" Do not these remarks apply very closely to our own condition? Apprenticeships are almost unknown among us in a majority of the trades. Among the manual industries as distinguished from the retailing trades the workmen's unions regulate the apprenticeship question. In some of the manufacturing branches they have "regulated" it with such nicety that an American boy has no possible chance to become an apprentice even if he so desires. In the stove molding industry, for instance, it is computed that under the rules of the union as at present in force it will not be a great many years before the genus stove-molder becomes extinct.

In our system of store-keeping, too, the apprentice is almost altogether unknown. When help is needed in a hardware store, a card placed in the window or a want advertisement in the daily paper generally brings it. The ides of seven years being required to learn "the multifarious intricacies of the ironmongery trade" is one which would be likely to furnish a good deal of humor to the average American young man who has his own way to make in the world, and who, in many instances, before reaching maturity thinks he has absorbed all the knowledge necessary to successfully "run" different kinds of business enterprises. It is true the knowledge he has gained is neither deep nor lasting—or at least it only lasts until the desire or the necessity for another change of occupation comes about.

It is to be feared that valuable as the apprenticeship system is, very few of our young men in the present day would care to bind themselves for seven years to learn the mysteries of any trade. In the argot of the day "life is too short" to permit what is perhaps erroneously considered a sacrifice of such a long term at small wages. In our country, too, the opportunities are so great, and our manner of life so changeable and feverish, that a practice which would appear to be an advantageous one in less go-ahead countries might be simply an abuse of opportunities here. We doubt very much, nevertheless, whether the abridgment by the labor unions of our youths' opportunities for learning useful trades, or the neglect of such opportunities on their own part, is fraught with beneficial results to the country or compensating advantages to themselves.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

We have a letter from a man in Pittsburg stating about what they may expect if they do not begin at once to abate the smoke nuisance. It is written by one who knows what he is saying, and he is farseeing and able. He does not stop with saying what will occur, but goes to places where smoke nuisances now rage and states what is there. The grimy, soiled walls of houses which might have been ornate and a beauty to the city, the large buildings literally covered with the soil of smoke, the inside of houses ruined almost by the same black pall, and everything created for the

ornamentation of the cities, made black and begrimed. Thus it is wherever the smoke is allowed to appear. It may be a small city, but the less smoke will be necessary to despoil it. Where there are any manufactories at all, there will be some smoke if it is not prevented. It is not a question of how much smoke, but the only question is, is there any smoke at all. If there is any, there should be some means set to work at once to prevent it.

We have before mentioned that while the city was small and not much smoke was being made, was the time to begin to abate it. Do not wait till the city gets large and black clouds of smoke are pouring all over it. Do not wait till it begins to be unbearable. Do not wait till you cannot stand it any longer, but begin now to abate the smoke, and you will find that it is easier, that you do not have so many to watch, and in after years you will find, both you and they will feel that it has been the easiest thing to do, by doing it as you did. You will then be without all the nuisances of the smoke, your city will grow up in accordance with your designs, your yards will be green in the summer time and white in the winter, and all the labor and toil that would have been necessary to remove dense, black clouds of smoke will be done away with. There is one or two things you may depend on doing: Either prevent smoke or prepare to suffer all of its abominations. You can now make up your minds to do one or the other. You can go to work energetically and enthusiastically, and depend on nothing but a perfect prevention of the smoke nuisance, or you may expect to suffer all the ruin to property and health that will arise. And while your cities are small and not much smoke is being made, is the time to begin to prevent it from being made. For if it once gets the start of you, you will find it will be much harder to stop. Men do not like not to do that which they have been doing all their lives. It is natural for them to make smoke. Unless they can be shown some methods in which they will make no smoke, and will use less, or at least, no more fuel, they will prefer to let the smoke continue. Acquaint yourselves with some device that will of a certainty prevent smoke when used. Do not pick up some cheap and worthless article, for that will do no good and will be a good sign for the smoke producers to point out when you are asking them to use some smoke-preventing device. But get a good one, one that will do the work correctly, and let it stand as a device not only intended to prevent smoke, but as one that will do it. There are a number of inferior kinds manufactured, and it may be that some of these have got into use. But they cut no figure in the market to the extent of establishing the fact that there are not those made that will prevent smoke.

If the village is small and no steps be taken to prevent smoke being made, the only thing that will await you will be regret. The time will come when the smoke will be a burden you will not want to bear. It is not like a load that can be lain down when the time comes. It is in a position to do you a great amount of harm regardless of anything which you may be able to do. The atmosphere is not pure when filled with smoke. Such as it is you must accept it, whether it brings sickness or draws out a life filled with pain. But this is not a question of what it should be—whether you should have smoke or whether you should not. It is clearly your right, by the rights of property and the laws of health, that you should not have it. You can find no higher rights than these. The rights of life and property have been recognized where the mind of man runneth not to the contrary, and for you to now sit down and give them up without a struggle is a sacrifice no one will insist upon. You have a right to a pure atmosphere as you have a right to a pure water. Supposing that the smoke was making as bad a mixture of your water that you are expected to drink, as it is of the air you are expected to breathe, would you allow it a minute? There is no more excuse for the one than the other. It is the nature of smoke to pollute the atmosphere. When it is made it immediately rushes out into the air, pollutes it, and you breathe it in and spit the unburned carbon out of the mouth. What is breathed has done a little toward a sore throat or lungs, until presently you find yourself sick and the smoke has been the cause of it all. Take my advice and begin at once the abatement of the smoke nuisance. Do not put it off, for it will be as hard to begin next spring as now. Get to work at it immediately and do not stop till you have the smoke out of sight and out of mind. You will never regret it.

REVIEWS AND NOTES.

We have received from W. T. Fitzgerald & Co., Washington, D. C., "American and Foreign Patents." The first article given in the pamphlet is on "The Age of Invention," and concludes that the present is the age. What may be patented and who may obtain patents, occupies quite a little space and seems to be very perfect. The different subjects of patents is discussed quite literally and their testimonials are good.

We are in receipt of the By-Laws and Resolutions of the Board of Health of the Province of Quebec. It contains besides these an appendix in which are found, Unsanitary Conditions or Nuisances, an act amending the public health, 1890, clauses from municipal code referring to sanitary matters. It is both in English and French, the left page being in English and the right in French.

"The latch string is always out. Pull it," came to us the other day and we proceeded to pull it. The door came open and we found on the inside a remark by the National Hot Water Heater Company that they had now at 405 Market street, San Francisco, a branch office where they shall keep a complete line of "Spence" Hot Water Heaters, including a new design especially adapted to the use of the inferior quality of soft coal which is in general use on the Pacific Coast. Works of this company are at Canton, Ohio.

From Geneva, N. Y., came a pretty little catalogue of the Dunning Hot Water and Steam boiler, manufactured by the New York Central Iron Works Company. The Dunning boiler is well known, having been in use for more than twenty years, and having always given good satisfaction. It is made entirely of wrought iron, or steel if preferred, and we cannot see where there is any cause for alarm. There are over 16,000 of them now in use and they do not seem to have any accidents reported from them. The Dunning self-feeder, base burning magazine boiler, holds a supply of coal for twenty-four hours, and this is as about as convenient as anyone could wish. The different boilers that are made and shown in the catalogue will strike hard for their share of the patronage.

With a final paper on "The Manufacture of Steel," in the November number, Mr. W. Durfee will conclude his contributions to the series of illustrated articles on the "Development of American Industries" now running in *The Popular Science Monthly*. The forthcoming paper completes the account of the Bessemer process, and proves that its chief feature was first developed by an American.

Do you use A. D. Valves? asks The Aherns & Ott Manufacturing Company. If so, state why. When A. D. Valves are used pipe does not have to be pulled down to replace them. In case of leak put on new disc, making valves good as new within five minutes. Saves time of engineer in re-grinding and replacing ordinary valves. Good, pass on. Ahern & Ott Manufacturing Company, Louisville, Ky.

We have received, with the compliments of the Pierce Steam Heating Company, their beautiful catalogue of 162 pages. It is handsomely bound, printed on excellent paper, well printed, and most profusely illustrated. It is to illustrate the steam and hot water radiators, manufactured at Buffalo, N. Y. They have also other offices at Boston, Mass., 42 Oliver street; New York, N. Y., 92 Centre street; Chicago, Ill., 111-113 Lake street; Minneapolis, Minn., 324 North First street; St. Paul, Minn., National German-American Bank building. From these centers these radiators are well known. It is useless for us to attempt to name the ones illustrated, and we will not try. There is one for every leaf and sometimes each leaf will contain two. Both the direct and the indirect kinds of heating are given and are plentiful from which to choose. There are six pages of radiators bronzes, showing the colors used. The direct radiator reference are well worthy of attention, as a glance at them will show how popular the radiators are. They have gone into almost every state and territory for fine houses in which their radiators are used, and have them illustrated. The indirect radiator references is not quite so copious but enough are given to prove the popularity of the same. Then comes their code for telegraphing, followed by their specialties, direct and indirect radiators, corner radiators, circular, semi circular and curved radiators, window radiators

stairway radiators and radiators bronzes. All in all it is a most handsome catalogue, and one that will not find the waste basket soon.

RESOLUTIONS OF RESPECT AND SYMPATHY

At the call of a special meeting held Monday the 26th inst., the following resolutions were passed by the master plumbers of Davenport:

Whereas. The Davenport Master Plumbers' Association has learned with regret and sorrow of the death of Joseph A. Macdonald, of New York, President of the National Association of Master Plumbers of the United States, therefore be it

Resolved, That in the death of Joseph A. Macdonald, the National Association of Master Plumbers have lost a worthy Executive Officer and a good member of the fraternity.

Resolved, That the Davenport members of the association tender their most sincere sympathy to the family of the deceased and condole with them in this the hour of affliction and trial.

Resolved, That these resolutions be spread upon the records of the Davenport Master Plumbers' Association and a copy be sent to the family of the deceased.

J. Cameron,
E. Dalzell,
R. Claxton, Committee.

RESOLUTIONS OF RESPECT AND CONDOLENCE.

At a special meeting of the New Haven, Conn., Master Plumbers' Association, held at their rooms on Tuesday, Oct. 27, 1891, the following preamble and resolutions were unanimously adopted:

Whereas, It has pleased Almighty God in his infinite wisdom to remove from our midst our honored President of the National Association of Master Plumbers, Joseph A. Macdonald,

Resolved, That the members of this association will ever hold in grateful remembrance his sterling business qualities, his integrity and clear-sightedness displayed in advocating the advisability of forming associations throughout the United States, and his effort in getting the names of every master plumber in his jurisdiction. All of this we found in our deceased President.

Resolved, That the sudden removal by death of our esteemed President from the position which he held as an officer of the National Association, creates a vacancy not easily filled, and that this association fully realizes and deeply deplores the loss to themselves and the fraternity at large.

Resolved, That we hereby extend our sympathy to the bereaved relatives and friends of the deceased, trusting that even in the sadness of their affliction they may yet find some consolation in knowing that the worth of his private qualities and the value of his public services are properly appreciated.

Andrew J. Clerkin,
Edward A. Rourke,
Franklin A. Curtiss,
S. E. Dibble, Committee.

HOUSE HEATING IN THE FUTURE.

Oberlin Smith in a lecture before the Franklin Institute, at Philadelphia, spoke as follows of the possibilities of the displacement of coal in favor of gas or electricity for heating purposes:

"In the matter of warmth there is certainly an inviting field for our future inventors. That our present methods of heating by the burning of coal and the non-burning of smoke, and of cooling by carrying in lumps of ice, are crude and wasteful, as well as extremely irregular and uncomfortable, it is not necessary to argue about. It seems probable that in the near future, at any rate for our cities, some system of gas heating will displace coal and wood to a large extent, and this is the more likely from the fact that our streets and houses are already supplied with the necessary pipes which may perhaps be gradually thrown out of use, as conveyors of illuminating gas, by the improvement and development of electric lighting. There also seems a tendency among inventors in recent years to attempt some kind of artificial cooling by the distribution through pipes of cold air or freezing mixtures of varying kinds; also to contrive cheap ice-making or other cooling machines, which can be economically used in individual buildings. All this is in a direct line of progress, but it seems probable that at some time in the future we shall depend upon the electric current brought into each building through a single wire, not only for our lighting and power, but for our heating and cooling also. Just how the latter process is to be accomplished we do not yet know, but reasoning by analogy, it would not seem outside the range of possibility when we consider the fact that the burning of coal in a furnace can be made to produce heat or cold at will. It is true that while electric heating in itself has been proved to be perfectly practicable, yet at present it is not economical. This is owing to the fact that our best and largest steam engines by which we run our dynamos utilize only from 10 to 15 per cent. of the energy stored in the coal, lavishly wasting the remainder. Fortunately, our dynamos have reached an efficiency of about 90 per cent., so that there is not much waste in using the electric current after the power to produce it is once generated. It is probable, therefore, that the use of electric heating will for the present be somewhat limited, and confined to special places where its convenience will offset its extra cost. For an extension of its employment thus, as for certain other important uses of electricity, and upon a scale far beyond anything we can now imagine, we must wait until we learn how to produce this current of pure energy from the coal or other fuel direct. Than the accomplishment of this feat, there is to-day no more fascinating problem in the realms of science. Many are working at it, with as yet but small success. We need not despair, however, as it seems to be a logical possibility, and the only thing required is to find out how to do it."

SANITARY KITCHENS.

BY MRS. E. E. KELLOGG, IN "GOOD HEALTH."

It is a mistake to suppose that any room, however small and unpleasantly situated, is "good enough" for a kitchen. This is the room where housekeepers pass a great portion of their time, and it should be one of the brightest and most convenient rooms in the house; for upon the results of no other department of woman's domain depend so greatly the health and comfort of the family as upon those involved in this "household workshop." The character of a person's work is more or less dependent upon his surroundings; hence is it to be greatly wondered at that a woman immured in a small, close, dimly-lighted room, whose only outlook may be the back alley or the woodshed, supplies her household with products far below the standard of health and housewifely skill?

Every kitchen should have windows on two sides of the room, and the sun should have free entrance through them; the windows should open from the top to allow a complete change of air; for light and fresh air are among the chief essentials to success in all departments of the household. Good drainage should also be provided, and the ventilation of the kitchen ought to be even more carefully attended to than that of a sleeping room. The ventilation of the kitchen should be so ample as to remove thoroughly all gases and odors, which, together with steam from boiling and other processes, generally invade and render to some degree unhealthful every other portion of the house. It is the steam from the kitchen which gives a fusty odor to the parlor air, and provides a wet-sheet pack for the occupant of the "spare bed." The only way of wholly eradicating this evil, is the adoption of the suggestion of the sanitary philosopher who places the kitchen at the top of the house.

To lessen the discomforts from heat, a ventilator may be placed above the range, that will carry out of the room all superfluous heat, and aid in removing the steam and odors from cooking food. The simplest form of such a ventilator is an inverted hopper of sheet iron fitted above the range, the upper and smaller end opening into a large flue adjacent to the smoke flue for the range. Care should be taken, however, to provide an ample ventilating shaft for this purpose, since a strong draft is required to secure the desired results.

Undoubtedly much of the distaste for, and neglect of, "house work," so often deplored in these days, arises from unpleasant surroundings. If the kitchen be light, airy, and tidy, and the utensils bright and clean, the work of compounding those articles of food which grace the table, and satisfy the appetite will be a pleasing task, and one entirely worthy of the most intelligent and cultivated woman.

It is desirable, from a sanitary standpoint, that the kitchen floor be made impervious to moisture; hence, concrete or tile floors are better than wooden floors. If wooden floors are used, they

should be constructed of narrow boards of hard wood, carefully joined, and thoroughly saturated with hot linseed oil, well rubbed in, to give polish to the surface.

Cleanliness is the great *desideratum*, and this can be best attained by having all woodwork in and about the kitchen coated with varnish; substances which cause stain and grease spots do not penetrate the wood when varnished, and can be easily removed with a damp cloth. Paint is preferable to whitewash or calcimine for the walls, since it is less affected by steam, and can be more readily cleaned. A carpet on a kitchen floor is out of place, as a kitchen sink would be in a parlor.

The elements of beauty should not be lacking in the kitchen. Pictures and fancy articles are inappropriate; but a few pots of easily-cultivated flowers on the window ledge or arranged upon brackets about the window in winter, and a window box arranged as a *jardiniere*, with vines and blooming plants in summer, will greatly brighten the room, and thus serve to lighten the task of those whose daily labor confines them to the precincts of the kitchen.

The furniture for a kitchen should not be cumbersome, and should be so made and dressed as to be easily cleaned. There should be plenty of cupboards, and each, for the sake of order, should be devoted to a special purpose. Cupboards with sliding doors are much superior to closets. They should be placed upon casters, so as to be easily moved, as they are thus not only more convenient but admit of more thorough cleanliness.

Lack of sufficient table room is often a great source of inconvenience to the housekeeper. To avoid this, arrange swinging tables or shelves at convenient points upon the wall which may be put up or let down as occasion demands. For ordinary kitchen uses, small tables of suitable height on easy-rolling casters, and with zinc tops, are she most convenient and most easily kept clean. It is quite as well that they be made without drawers, which are too apt to become receptacles for a heterogeneous mass of rubbish. If desirable to have some convenient place for keeping articles which are frequently required for use, it might be an advantage to arrange small shelves about and above the range, on which may be kept various articles necessary for cooking purposes.

One of the most indispensable articles of furnishing for a well-appointed kitchen is a sink; however, a sink must be properly constructed and well cared for, or it is likely to become a source of great danger to the health of the inmates of the household. Earthenware is the best material for kitchen sinks. Iron is very serviceable, but corrodes, and if painted or enameled, this soon wears off. Wood is objectionable from a sanitary standpoint. A sink made of wood lined with copper answers well for a long time, if properly cared for.

The sink should, if possible, stand out from the wall, so as to allow free access to all sides of it, for the sake of cleanliness, and under no circumstances should there be any inclosure of woodwork or cupboards underneath, to serve as a storage place for pots and kettles and all kinds of rubbish, dust and germs. It should be supported on legs, and the space below should be open for inspection at all times. The pipes and fixtures should be selected and placed by a competent plumber.

FOR THE DIGESTION.

It seems cruel to sue a campaign liar for libel. It looks like discouraging enterprise.—*Columbus Post.*

"Cleanliness next to godliness," remarked the man who set up a Turkish bath establishment adjoining a church.—*Kate Field's Washington.*

Sea Captain—"There is no hope! The ship is doomed! In an hour we will all be dead!" Seasick Passenger—"Thank heaven!" —*New York Weekly.*

Mrs. Gadd—"Does your boy take after you or his father?" Mrs. Gabb—"He takes after his father. You never can believe a word he says."—*Good News.*

George—"Never mind; there are as good fish in the sea as ever were caught." Ethel—"I should advise you to try still fishing."—*New York Herald.*

"I should think life in this flat wouldn't be very pleasant. That factory chimney opposite smokes horribly." "We have one consolation, though." "What's that?" "It doesn't smoke cigarettes." —*Buffalo Express.*

Love is a sickness and marriage the convalescent period. You have heard, no doubt, that people are crossest when they are getting well.—*Atchison Globe.*

When it is remembered how slowly but with crushing effect the glaciers move it is not difficult to believe that the "tooth of time" must be a grinder.—*Lowell Courier.*

Watts—"Wickwire seems to have an ideal home." Potts—"Doesn't he, though? He stays down-town until midnight bragging about it five or six days out of the week."—*Indianapolis Journal.*

If the women of to-day powdered their hair it would be easier to bang.—*Pittsburg Dispatch.*

Monuments are not always erected to the men who are buried in thought.—*Detroit Free Press.*

You can't estimate a man's liberality by what he thinks you ought to give.—*Elmira Gazette.*

It is by "eating crow" that the public man must sometimes show his devotion to the political caws.—*Washington Star.*

The course of true love may never run smooth, but that fact doesn't prevent the lovers from striking a gate now and then.—*Binghamton Leader.*

Mrs. Watts—"I suppose it is owing to lack of time that you never wash your face?" Hungry Higgins—"Yes'm. I'm too busy scourin' the country."—*Indianapolis Journal.*

Maddox (waking from a nap)—"I must have been sound asleep." Gazzam (who has been annoyed by Maddox's snoring)—"You were. I heard the sound."—*Harper's Bazar.*

Onyx (an autograph enthusiast)—"Wouldn't you like to see my collection? It's worth several thousand dollars." The Rev. Mr. Smirke—"Indeed I should. Mine last Sunday was $8.64."—*Boston Post.*

Hired Boy (on a farm)—"Kin I go fishin' this afternoon? Farmer—"No, but be a good boy and work hard an' mebbe next week you kin go to a funeral." Hired Boy—"Kin I go to your'n?" —*Epoch.*

"By George," said Smithers, angrily, about a week after he had moved into the country, "every blessed thing I meet seems to have a bill for something." "Yes," said little Johnny Smithers, "there was a rooster here this morning with a bill for corn."—*Truth.*

Mr. R. E. Turner—"How is Bingers getting along? Is he as open-handed as ever?" Mr. Staidthere—"O, yes. But his hand is open now in the hope that some one will drop something into it." —*Indianapolis Journal.*

William Ann—"I want you to come and take that burglar alarm right out of my house." Electrician—"Doesn't it work?" William Ann—Work! It has scared a burglar to death and his widow has sued me for $5,000 damages."—*Brooklyn Life.*

Visitor (to inhabitant of very small village)—"But surely you must find it very dull here, never getting any newspapers. How d'you know what is going on in London, for instance? Inhabitant —"Eh, mon! but dinna ye ken that th' folk in Lunnon are just as ignorant o' what's gaun on wi' us?"—*Judy.*

TOO OLD TO LEARN.

I am sumthin' of a vet'ran just a turnin' eighty year,
A man that's hale and hearty and a stranger tew all fear;
But I've heerd some news this mornin' that has made my
old head spin,
And I'm goin' to ease my conshuns if I never speak ag'in.

I've lived my four-score years of life, and never 'till to-day
Was I taken for a jackass or an ign'rant kind o' jay,
Tew be stuffed with such durned nonsense 'bout them
crawlin' bugs and worms
That's a-killin' human bein's with their microscopic germs.

They say there's "microbes" all around a-huntin' for their
prey;
There's nothin' pure tew eat or drink or no safe place to
stay.

There's "miasmy" in the dew-fall and "malary" in the sun;
'Taint safe to be out-doors at noon or when the day is done.

There's "bactery" in the water and "tricheeney" in meat,
"Ameeby" in the atmosfeer, "calory" in the heat;
There's "corpussels and pigments" in a human bein's blood,
And every other kind of thing existin' since the flood.

Terbacker's full of "nickerteen," whatever that may be,
And your throat will all get puckered up with "tannin" in in the tea;
The butter's "oily-margareen," it never saw a cow,
And things is gettin' wus and wus from what they be just now.

Them bugs is all about us, jest a-waitin' for a chance
Tew navigate our vitals and tew 'naw us off like plants.
There's men that spends a lifetime huntin' worms jest like a goose,
And tackin' Latin names to 'em and lettin' on 'em loose.

Now, I don't believe such nonsense, and don't intend to try;
If things has come tew such a pass I'm satisfied to die.
I'll go hang me in the sullar, for I won't be such a fool
As tew wait until I'm pizened by a annymallycool.

—*Anon.*

PLUMBING NOTES.

Mr. A. P. Henderson, who is making his home in Madison, Wis., after forty years' experience as a plumber in New York, in discussing the sewer question the other day remarked:

"After all the sewers are but a small item as regards health as compared with plumbing. This should be under rigid supervision of the health department. One thing that is likely to be overlooked is proper ventilation of the pipes. I am in favor myself of carrying the ventilating pipes clear up to the roof from the main sewers, thus doing away with traps on pipes at the point of entering buildings. We were long obliged, in New York, to put in a trap where the pipes entered the cellar, and carrying an outlet back to a grating by the sidewalk. I always opposed this because the foul air would be forced out whenever there was a gush of water from above. This is not now required by the Board of Health of that city."

Samuel B. Clark, plumber, at No. 105 West Ninth street, Willington, Del., while walking along that street last week, picked up a wallet and upon an examination found that it contained $550 in greenbacks and an endorsed check for $600. The name of George W. Simpler was endorsed on the check and Mr. Clark, thinking that it was Levi Courtman Simpler, hurriedly carried the purse to him at the United States court room, but found that George W. Simpler lived at St. Georges and was on the grand jury at the custom house. He went there, but Simpler had gone home. 'Squire Sutton, of St. Georges, said the wallet belonged to Mr. Simpler and he would take it to him. He was given the purse.

John B. Smith has just completed the plumbing and gas fitting in the residence of P. L. Davis, on First North street, Vicksburg, Miss., also is now engaged in fitting up the building of Charles Kette, on Openwood street.

A choice collection of relics which should be labelled "Plumbing, and How it is Done in Denver," was placed on exhibition at the city health office last week. The exhibit conveys more information on the subject in one minute than could be learned from weeks of hard study at the public library. At the same time the inquirer is led to wonder that the death rate of the city is not triple the rate reported from month to month. If sewer-gas is one-tenth as dangerous as is commonly supposed, it is a marvel that hundreds of people living in the older residences of the city are alive to-day.

The curiosities include everything in the shape of a pipe—iron pipe, lead pipe, tin pipe, zinc pipe and pipe manufactured out of tin foil which at one time did service as a wrapper for plugs of tobacco. Then the ingenious methods of uniting the ends of the pipes together would drive an ordinary mechanic crazy. In some cases a coating of solder was used so thin that a sheet of paper would have proven much more efficacious as a fastener.

Under the floor of a bed room was found an iron pipe five inches in diameter, connecting the water closet with the sewer. A section of the pipe is shown which some genius attempted to mend by wrapping a piece of tin around the pipe, the tin being held in place by a wire fastening. The inspector forgot to ask how many deaths from typhoid fever had occurred in the house.

An oddity in the shape of a trap was shown which was taken from a sleeping room of one of the hotels. The inspector explains that the trap was certain to permit the escape of deadly gas regardless of any attempt to shut off the flow.

Samples of plumbing are shown from Capital hill houses and from terraces of the city which show criminal negligence of property owners in failing to engage competent workmen to make repairs. Inspector McGann says that most of the bad work was done years ago, when the city made no attempt to inspect the plumbing.

There will be a meeting of the Executive Committee of the National Association of Master Plumbers called at the New York office on the 9th of November. This is occasioned by the death of Joseph A. Macdonald, and all will know about what will be accomplished.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

Chicago, Ill.: Clinton J. Warren has completed plans for the 8-story apartment house, 225x125, which he, with A. W. Maltby, will erect at the southeast corner of Clark street and North ave. The exterior will be fireproof and elaborately finished, and provided with elevators, steam heat and electric light; cost $400,000. Work will be commenced at once. Flanders & Zimmerman have completed plans for an elegant 3-story residence, 35x75, for Daniel Crilly, to be built at Michigan avenue and 38th street. The interior will be finished in hardwood and heated by hot water; cost, $50,000. The same architects have let contracts for two 3-story school buildings, to be erected by the Board of Education. The one will be 70x135, and will be built at the northeast corner of 31st and Deering streets, and will be heated by steam; cost, $70,000. The other will be 120x140, and will be erected at West Harrison street and Sacramento avenue; cost, $70,000. Wilson & Marble have plans under way for a 4-story apartment house, 50x90, to be built on Bowen near Vincennes avenue, by H. R. Wilson. It will be finely finished in hardwood and heated by steam and will be provided with an elevator; cost, $40,000. F. B. Abbott has designed a 2-story residence, 34x63, for A. S. Hall, to be built at 5535 Washington avenue. It will be of boulder stone and cement, with elaborate interior finishing, including hot water heating and electricity; cost, $10,000. He has also planned a 2-story frame residence, 23x43, for Mrs. Mary E. Weber, to be built at Oak Park. W. J. Van Keuren has designed six 2-story and basement dwellings, 132x45, to be built at Oak Park by S. A. Rothermel; pressed brick and stone construction; cost, $30,000. L. G. Hallberg has let contracts for the erection of four 3-story store and flat buildings, 80x60, to be built on Clark street, near School, by himself. They will be constructed of pressed brick and stone; cost, $30,000. Frederick Alschlager has let contracts for the erection of a 4-story store and flat building, 24x83, for Christian Gudergolm, at the northwest corner of 63d and Green streets. It will be constructed of pressed brick and stone; cost, $12,000. Furst & Rudolph have let contracts for a 4-story store and flat building, to be built on Wentworth avenue, near 33d street, by Andrew Wachter. It will be of stone and cost $10,000. Adler & Sullivan are preparing plans for a 7-story warehouse, 101x114, to be built at the southwest corner of La Salle and Michigan streets, by J. W. Oakley. It will be of pressed brick and stone, the interior being of mill construction; cost, $100,000. August Fiedler has planned a 3-story residence, 48x75, for Jacob F. Rehm, to be built on Dearborn avenue, near North avenue. It will be of pressed brick and stone with hardwood interior, and will be heated by hot water; cost, $20,000. J. M. Van Osdel & Co. are preparing plans for a 14-story office building, 75x67, to be erected at 353-57 Dearborn street, by J. W. Ellsworth. The interior will be fireproof, heated by steam, and lighted by electricity; cost, $250,000. Architect Francis J. Norton has drawings for a block of five buildings for Mr. M. Reich, of Englewood, 125x65, 59th street, corner of Tracey avenue, Englewood. They will consist of stores and apartments; the ex-

terior will be built of pressed brick and Bloomington Bedford stone, iron fronts, piers and columns, with copper bays and three round projecting towers, with three double entrances on 59th street and massive arches in front, composition roof, patent skylights, rear porches, cut and stained glass. The interior will be finished with maple done in oil, solid bronze hardware, electric wiring, electric bells, speaking tubes, marble halls, twenty bath room outfits, with all sanitary appliances, floors deafened with mineral wool, center-pieces, grille-work in dining-room and parlor, stationary mirrors, wash bowls, tile mantels, etc.; work will commence at once; cost, $58,000. Mr. Norton is also letting contracts for a double residence, 40x50, to be erected at Wright and 67th streets, for Mr. E. C. Draper. It will be built of stone in front, and pressed brick for the sides. The halls will be finished with Davison & Sons' New York marble, steam heat, electric wiring throughout, electric bells, bath-room outfits, hardwood oil finish, speaking tubes, composition roof, copper bays and side verandas; cost, $10,000. Mr. Norton is also working on plans for two additional stories for the Fitch 6-story building at Wabash avenue and 37th, the present structure is already built on the fourth story; the total cost of the building will be $100,000.——New York City, N. Y.: It is stated that Cyrus L. W. Eidlitz has been commissioned to draw the plans for the Texas State building at the Columbian Exposition. Two 5-story tenements, 25x80.6 are to be erected for Theodore Van Eupen, at 331-333 West 16th street. Max Muller, architect. Kurtzer & Rohl have plans for a 6-story brick, stone and terra cotta apartment house, 37.6x95.6, to cost $40,000. Geo. Hornberger, owner. J. C. Burne is the architect for the $25,000 stone and terra cotta apartment house, to be built for J. W. French, on the south side of 85th street, 304.6 feet east of Third avenue, 25x90. F. Ebeling has plans for a 6-story factory, 26x90, to be built at 20 Forsyth street, at a cost of $24,000. Thomas C. Van Brunt will erect thirty-five 3-story brick and stone dwellings on the north side of 136th street, between Seventh and Eighth avenues, from plans of Thayer & Robinson. John C. Burne has plans for a 4-story and basement brownstone front dwelling, 25x60, with extension, to be erected by Frederick Aldhous, at 108 West 76th street, at a cost of $35,000. The same architect will furnish plans for five 5-story brick, stone and terra cotta front flats, to be built on the north side of 103d street, 180 feet west of Park avenue, at a cost of $100,000; the size will be 25x69, with a 13x6 extension. James A. Breen will build five 4-story brownstone front dwellings, on a lot 100x100, on the south side of 87th street, 150 feet west of Central Park West. Ogden & Fountain will build two 5-story brick and stone flats, one 25x63 and extension, and one 25x71 in size, on the southeast corner of Brook avenue and 149th street, to cost $33,000.——Cincinnati, O.: Architect W. W. Franklin has plans for four double dwellings for H. Pogne, to be two and one half stories, built of brick, with stone foundation and trimmings; cost, $40,000. Architect H. E. Siter has plans for a school building, to be erected at Avondale, O., for the Board of Education. To be built of pressed brick with stone foundation and trimmings; cost, $25,000.——Washington, D. C.: The corner of 17th and Q streets is to be improved with a block of eight residences by T. F. Schneider. The fronts will be of Indiana limestone and pressed brick. Darby & Davis are the builders; cost, $60,000.——Milwaukee, Wis.: The Jos. Schlitz Brewing Co. are making extensive changes in their brewery plant. The main building on 2d street, between Galena and Walnut, where a permit was taken out this week for a $90,000 building, will be started in a short time. The total cost of this change will be near $300,000. Architects H. C. Koch & Co. have plans for a warehouse to be erected corner Buffalo and Broadway for the Ludington estate; to be 120x120, seven stories, built of common and ornamental brick, with stone foundation and trimmings and terra cotta; cost, $125,000.

HEATING AND LIGHTING.

The following electric light companies have been recently organized: International Electric Mfg. Co., of Chicago, Ill.; E. T. Brainerd and Thomas E. Rushbrook; $100,000. McLeod Electric Mfg. Co., of Brooklyn, N. Y.; J. N. McLeod; $3,000. Niagara Power Co., of Buffalo, N. Y.; to use electricity from the water power tunnel plant; C. A. Sweet, Wm. Hamlin and F. D. Locke; $40,000.——Geneva, Ill.: A committee has been appointed to obtain subscriptions for an electric light plant for Geneva and St. Charles. R. W. Sanborn and P. T. Bartholomew are on the committee.——Glenwood, Ia.: A vote will be taken Nov. 3 on the granting of an electric light franchise to J. D. Paddock and L. W. Boehner.

SEWERAGE NOTES.

Berlin, N. H.: The Berlin Aqueduct Co. is considering the question of water-supply and sewerage.——The Weirs, N. H.: Surveys are being made for the proposed water supply and sewerage system.——Brooklyn, N. Y.: A relief sewer is to be built to drain the flooded district of the 26th ward. It will be 24 inches in diameter and cost $16,000.——Greenville, S. C.: A system of sewers to cost $75,000 is proposed.——Blue Island, Ill.: Contracts are to be advertised shortly for a sewerage system to cost $150,000.——Ogden, Utah: Contracts will soon be let for sewer district No. 3; the work will cost about $17,000.——Los Angeles, Cal.: The Council and Board of Trade are discussing the need of improved sewerage.——South Berkeley, Cal: A plan for a system of main sewers, located according to districts, has been prepared by Mr. King, the engineer.

WATER WORKS NOTES.

Laurens, N. Y.: The agitation for works continues.——Le Roy, N. Y.: The trustees have instructed the clerk to secure information as to the cost of water works. Fire protection is now furnished under a contract which now has three years to run.——Fishkill and Matteawan, N. Y.: The Matteawan Board of Trade is discussing village works. The present supply is from a company, and it is stated that for three years out of five the supply has been unadequate in the summer.——Mechanicsville, N. Y.: Nov. 3 the people will vote on the proposed works.——Newberg, N. Y.: The commissioners have rescinded their request for an election to vote on the issuance of $75,000 for improvements, and have voted to employ J. D. Van Buren to make a preliminary examination of the water supply.——Cassopolis, Mich.: Bonds for works to the amount of $10,000 have been voted.——Edmore, Mich.: Works are being discussed.——Jackson, Mich.: W. S. Parker has been engaged as consulting engineer for the water works improvements.——Kalamazoo, Mich.: We are informed that W. R. Coats has recommended a 2,000,000-gallon elevated reservoir, or tank, be added to the present direct pumping system. For pipe connections, 2,000 feet each of 24 and 16-in. and 1,400 feet of 20-in. mains would be necessary.——Mancelona, Mich.: The sum of $15,000 has just been voted for works.——Ridge Farm, Ill.: It is reported that works are to be built.——Tolono, Ill.: Water has been secured from a new 150-ft. public well, and there is now talk of building works.——Colfax, Wash.: Bids are wanted by the city until Nov. 5, for a supply well and receiving basin, a 1,000,000 gall. pumping plant, 500,000-gall. reservoir, about five miles of 10 to 4-in. pipe, 38 10 to 4-in. stop gates, hydrants and all labor. Address Chairman Committee on Fire and Water.——Aiken, S. C. A report on proposed works is to be made for the council by J. C. Chase, Wilmington, N. C.——New Berne, N. C.: Address W. D. Wallace, City Clerk, regarding proposals for city works.——Kirksville, Mo.: A vote will be taken Nov. 3 on the issuance of $38,000 of bonds for water and electric lights.——Beaumont, Tex.: Bonds to the amount of $6,000 will be issued to extend the works.——Giddings, Tex.: An effort is being made to organize a company.——Princeton, Ky.: The trustees will employ an engineer to report on proposed works.——Standford, Ky.: Address Mayor W. Vandeveer or J. S. Hughes regarding bids for building works.——Worcester, Mass.: An 8-in. cement main will be replaced by a 12-in. cast-iron pipe.——Woonsocket, R. I.: A $200,000 4 per cent. loan is proposed for funding the city's floating debt and for water works improvements.——Waterbury, Conn.: An examination and report upon a new water supply will be made by Rudolph Hering, New York.——Orange, Tex.: It is reported that a water company has been organized.——Berlin, N. H.: Water works and sewers are being talked of, and a meeting of the Berlin Aqueduct Co. has been called.——Groveton, N. H.: Works are talked of.——Portsmouth, N. H.: Business men are talking of bringing in water from Jones Pond, about 2 miles distant. The present works were built by a company and are small.——The Weirs, N. H.: Surveys are being made for water works and sewers. Works have been pro-

jected for some time by the Weirs Water Works Co.——Stockton, Pa.: A company to supply the villages of the township, a suburb of Camden, N. J., is projected by George Pfieffer, Jr.

BIDS AND CONTRACTS.

Cape Girardeau, Mo.: The city desires to let a franchise to a private company to build and operate water works. Sealed proposals for same will be received until Dec. 7. Address H. P. Pieromut, mayor.——Cleveland, O.: Proposals of electric lighting for 1892 will be recived Nov. 4 by R. R. Herrick, director of public works.——Terre Haute, Ind.: The city clerk has been instructed to advertise for bids for lighting the city for three years. The committee appointed to purchase the electric light works has reported that the company would sell either the city circuit or both the city and the commercial circuits, but would not fix a price until the committee should be given power to act. The committee has been given such power.——McKeesport, Pa.: Proposals are wanted until Nov. 5, for furnishing, etc., two 3,000,000 gallon horizontal duplex direct-acting, compound condensing, a non-compound condensing, rotative pumping engines of the outside center packed water plunger pattern. Address Joseph Ecoff, water works superintendent, as above.——Henrietta, Tex.: H. J. Strickfadden, city secretary, wants bids for a complete system of water works, an electric light plant and an ice plant No date specified.——Tekoa, Wash.: Proposals are wanted until Nov. 1, for the construction of a system of water works. Address Town Clerk C. F. Lake for particulars.——Lansingburgh, N. Y.: Proposals are wanted until Nov. 9, for the construction of main and other sewers. Address W. S. Franklin, engineer, as above.——Dallas, Tex.: Proposals are wanted until Nov. 15, for the construction of a system of water works. Address the city clerk, as above.——Pawhuska, Oklahoma: L. J. Miles, U. S. Indian Agent, will receive bids until Nov. 5, for the erection of a school building and boiler house, also for putting steam heat and plumbing in different buildings.——Victoria, Tex.: Proposals are wanted until Nov. 17, for the erection of a court house. Address E. A. Perrenot, county clerk, as above.

FLORIDA AND THE SUNNY SOUTH VIA THE BIG FOUR ROUTE.

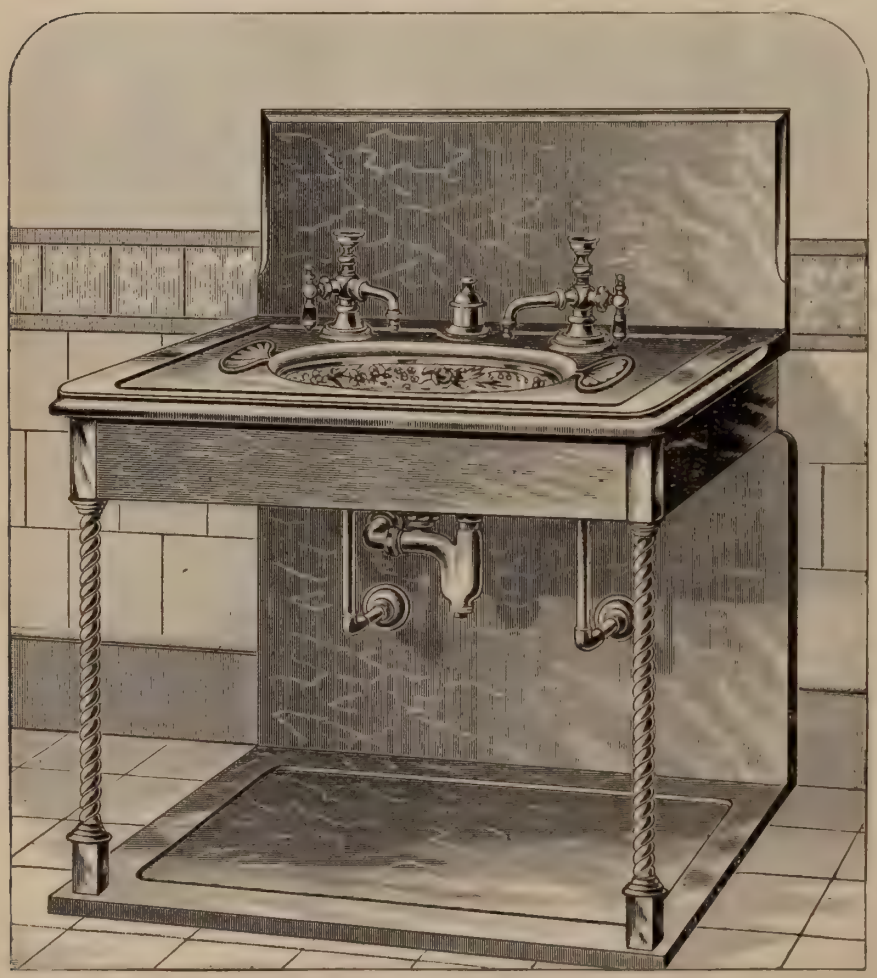
To all persons contemplating a southern trip, the Big Four Route offers special attractions and advantages possessed by no other line. Solid Vestibuled trains, heated with steam and equipped with palace sleeping cars, reclining chair cars and elegant parlor cafe dining cars run daily, making connection in Central Union Station, Cincinnati, with through express trains of the Queen & Crescent Route, Louisville & Nashville, Kentucky Central and Chesapeake & Ohio Railways, avoiding the tedious transfer necessary via other lines, and affording practically through train service to Old Point Comfort, Asheville, Chattanooga, New Orleans, Savannah, Jacksonville, St. Augustine, Tampa, Indian River, and all winter resorts of the South. Tourist tickets via the Popular Big Four Route at special low rates are on sale at all coupon ticket offices throughout the country. Ask the agent for tickets via the Big Four Route. J. C. Tucker, G. N. A., 234 Clark street, Chicago. D. B. Martin, General Passenger and Ticket Agent, Cincinnati, Ohio.

Thirty million dollars has been expended on London's drainage system in the last 33 years.

There are six tunnels in the world which have a length exceeding 21,000 feet—St. Gothard, Mount Cenis, Hoosac, Severn, Nochistongs and Setis. St. Gothard, the longest, is 48,840 feet; Setis, the shortest, is 21,120 feet.

The streets of Helena, Mont. are not exactly paved with gold, nor can one pick up a livehood in nuggets from the roadway, but cellar digging is apt to uncover enough gold to pay for the labor and sometimes more. In digging the foundations of a business block there the interested parties are taking out a $100 per day in pay dirt, and do not seem to think it a remarkable find either.

No. 4.



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THE plumber who works for glory must have an income op which he could retire.

* * *

EVERY member taken into a local association is building un the National Association that much.

* * *

IT IS not the idle man who makes the most out of his trade, but the man who works while others sleep, and charges a fair price for his labors.

* * *

THE lady plumbers are few and far between, but the only one we ever heard of was a success. She got right down to business, and when she had a job finished it was all right. There is something to learn from her. Learn to do good work and to be always after more.

* * *

PLUMBING is peculiar to itself. It is not like any other trade. There is more to plumbing than any other one calling. It must be done mechanically well to insure a good job, and scientifically perfect to secure a healthful home.

* * *

THE subject of the removal of garbage is receiving a good portion of discussion. Don't remove it, any portion of it, so the smell of its decay will come back. It is a big undertaking for a big city, to remove its garbage in such a way that it will give no offence. Dumping it in a water-course, on a lake or sea, is not getting rid of it to all purposes. In the first case it will wash down and become a pest about another town. In the second or third, it will wash back to shore and breed a pestilence there. The surer way to handle garbage is to destroy it. It can then hurt no one as it has no existence. Piled up in almost any place it will find some way of giving off the evils of its decay to the injury of some one. Destroyed, placed out of existence, it is gone and there is nothing left. No one will be offended by it, and no means are left whereby it can come into the home or whereabouts of the people. It may not be the best way to serve garbage, but it is a safe way, and at the present time we know of no other that will prove any better.

* * *

PLUMBERS should remember that all the money they make while working at their trade, is to be set down as what is due them after all expenses are paid—what is left. They should also remember that when they take a contract in which they know the profits will be small, their share of the work when it is done will be small. There is no way by which money can be made by the plumbing trade, than to charge in the first place enough for your work. Get what it is going to cost to do the work in detail and then put your profit on it. Man is not supposed to work for nothing. He is always expected to make a fair profit on whatever he engages in. No man could be expected to work for nothing. He would soon run down at it, and so will he soon run behind when working for too little. Plumbing is a work that must be done, and it is such in relation to health that it must be well done. The price for plumbing work is being cut too often below what any man would be willing to furnish first-class work for. This is not right. A good plumber will feel that his work represents himself, and that others will feel so, and will place a fair profit on it. It is all right to make a living and something more out of our trade.

* * *

IT IS not every man's full discharge of his duties to simply advance his own interest. We may work for interests to some extent, but we must be willing to give part of our time and our labors for the good of our fellowmen, for the good of our city, state and nation. The one who will not accept the opportunity to do a favor for another, help him a little bit, is soon looked upon as a man without fellow-feeling and is placed aside by the general public as a close-fisted old fogy. If this be true in the general walks of life, how much more must it be true within a fraternity, within the closer ties of brotherly love? We have organized an association of master plumbers and have carried it on successfully for some years. It is now doing well, but do not we who are members see the good resulting from our membership with it, to be good enough to be enjoyed by all master plumbers? We have been connected with it ever since it was started and would not be without it for anything. We would not go back to the days before it was organized for anything in the world. It has done us more good than any-

thing which we could have devised. Let us become members of self-appointed committees to increase our membership. Let us take in all reputable master plumbers within our cities, and establish the organization in cities where it is not to-day found. This will be doing some good in the cause and the greatest good to those who are not to-day within our sheltering fold. Let us each find one man to be taken in within the year, and by so making him a member, increasing our general membership two fold. It will be a great day for the National Association when it is done.

* * *

THERE are some states which have places where there have been no local association of master plumbers made. In order to help increase our National Association of members, let the people near these places where there is no association go to work and organize local associations of master plumbers. True there are officers appointed to attend to this, but that does not say that any member of any local association cannot organize such association. Let any member when he has an opportunity go to work and put in a local association. It will not hurt him, but will be good for him and good for the National Association. Look at what was done last year by a few men. Suppose all had worked as hard as these few, what may we not have been? It is not much for one or two men to do who are situated near where there is a local association to be organized to go right over and organize it. The state vice-president may not be near, but that makes no difference. Get the plumbers ready for an organization, send for the state vice-president and he will come. You will have a good time together and the result will be one more local association added to the National Association as soon as affiliation can be had. It will pay all to go to work organizing those local associations and having them to affiliate with the National Association.

* * *

THE local associations of master plumbers can become useful by soliciting for their own membership. There are some places where these local organizations have in them all the master plumbers in the city. Of course these could do no more good in this way, but the majority of cities have good master plumbers in them who are still without the association and who would become good members. We cannot give any means by which they might be brought within the fold, for what might be good in one city might not prove profitable in another. It is true, however, that there is room for much work in this direction, with the opportunity of doing much more good than one might at first think. There should be a desire among all local associations to get every reputable master plumber within their city a full fledged member with them before the next convention. It would greatly increase the force of the National Association could it number as its members every one entitled to belong to it. It would give it a force as great as almost any body of men outside of political parties. It would find that when it speaks it would be listened to to a greater extent than now. Why cannot the local associations go to work getting every master plumber in their cities as members of their associations? It would result in a greatly increased membership of the National Association where we need men to work.

NEWS AND NOTES.

What is now wanted is a nickel in the slot machine that will register how much one knows.—*Boston Transcript.*

Peter Johnson, of Dassel, Minn., claims to have discovered the lost art of tempering copper. He and Nils Nilson, a machinist, want to organize a company to build a factory in Minneapolis.

A new alloy of lead, very malleable, only slightly affected by acids, consisting of 945 parts of lead, 22 of antimony and 13 of mercury, is, according to the *Revue Industrielle*, being introduced by M. Worms for accumulator plates.

Mr. Hawksley, the well-known boiler-maker, has invented a new boiler for esparto and straw which he has just patented. The idea is to obtain the circulation of the caustic leys without direct contact with the steam, thus maintaining or rather increasing the strength of the leys during the process of boiling. The steam is confined in the casing round brass tubes through which the caustic solution circulates, gaining heat and effectiveness as it rises.—*Invention, London.*

The difficulty of applying concrete under water can be overcome by filling a wooden pipe with the substance, and lowering it, end first, over the spot where it is to be deposited. By lifting the pipe from the bottom the concrete will spread out without mixing with the water. The precaution should be taken to have the pipe long enough to extend 4 or 5 ft. above water when resting on the bottom, filling as required so as to retain the proper "head."—*Invention, London.*

A new alloy of aluminum and titantum has been discovered and patented by Prof. J. W. Langley, which possesses remarkable hardness—not so much in the cast form as when the metal is rolled or otherwise worked. Tools can be made of this alloy with a cutting edge which will hold nearly as well as of steel. At the same time the metal has a spring which will make it of considerable use for many purposes. The specific gravity of the new alloy is not much greater than that of pure aluminum. The amount of titanium used is very small.

The question of power and its most economical transmission is an equally important factor in general conduct of business as any other, though it is perhaps most neglected of all. Attention is paid to the various other points of possible leakage, and the cost of production calculated accordingly. Economic and efficient results are looked for everywhere else than in the power department. Delays are caused by stoppages, simply because those having general supervision of the plant are unfamiliar with the requisites of power transmission.—*Paper and Press.*

A new use has been found for waste glass by Messrs. Rostaing, Garchey and Geille, of Paris. Any fragments of broken glass of various colors are mixed together, after having been broken to a suitable size; they are then placed in moulds lined with silica, talc, or some other resisting material and fired. A coherent mass is produced which can be dressed and cut into blocks, which are course, irregularly colored. Such blocks may be used as artificial marble. The blocks are usually rough on one side, owing perhaps to incomplete fusion; this gives a surface which is admirably adapted for causing them, especially if they are slab like in form, to adhere to walls with the addition of a little mortar. Fine decorative effects can thus be produced. Designs in relief can be obtained by pressing while the block or slab is still plastic. If a suitable mould be prepared with movable partitions, then pieces of glass can be arranged in such a way that, upon firing, a very effective "stained glass" window is produced, the necessity of using "leading," as in the ordinary way, being thus obviated.—*Invention, London.*

RELATION OF PLUMBERS AND PHYSICIANS.

The following was presented at the American Public Health Association at Kansas City, Mo., June 23, 1891, by Andrew Young, and referred to the Publication Committee:

Mr. President and Gentlemen of the Convention:

In bringing before you the subject of the present occasion, I do so because the plumber and the physician are not what they were. The advancement made with the plumber in the last decade, outstrips all other reaches made in the scientific directions of his trade. In scientific direction, in mechanical skill, in the whole work that goes to make up plumbing, he does not stand today in the shadow of where he stood ten years ago. The manufacturers of plumbers' supplies have had to adapt their output to meet the demands of the last decade, as if they were making products for a new class. The old closets, fixtures of all kinds, old pipes, and the plumbing material of all kinds have so changed that if anyone were now making the old kind, they would have no market on which to sell them. There are plumbers at work today who have never known the use of the old plumbing fixtures, and let us pray they never may. We have advanced with remarkable strides since we learned the relation we sustained to sanitary science or preventive medicine. We found we were doing work that was unventilated, that was so situated that it could not help but breathe up the sewer gas, and breathe it out in the rooms of the houses without there being any kind of a remedy put forward. We toiled on in this way, hard work it was, and while we felt we were not doing the best for the household, who were going to give us a better means, and bring us out to this better and brighter day?

Plumbing is no longer a mere trade. Its importance and value in relation to health and its requirements regarding scientific

knowledge have elevated it to a profession. It is clothed with the responsibilities of the learned professions and the dignity of the sciences. The high qualities of mechanical skill are combined with the knowledge of the best sciences of the most practical utility. It unites skilled labor and high educational qualifications in one. This being the nature of plumbing to-day, it becomes the duty of the plumber to maintain in every way the dignity of his high calling. It should be his special care to have the profession as free as possible from the deleterious effects of the incompetent and unscrupulous. He cannot afford to have the high position to which plumbing has attained tainted by the ill influences of the unworthy and unqualified. The results of his labors in every instance should be added evidence of his skill and capacity in meeting the demands of the highest and latest approved requirements of sanitary science. He has a responsibility that rests upon none other. To a great extent the healthfulness of our homes and the vigor of our country depend on the character of his work. This responsibility gives to the plumbing profession a dignity and importance that attach to few others, and places upon the plumber the duty of qualifying himself to maintain under all circumstances and conditions the dignity which public sentiment has placed upon him and which his position among the learned professions demand.

The day of the tinker and scrimper is happily past. Out of the labors and influences of the National Association of Master Plumbers has come a new era. The relations of trade interests, legislative councils, boards of health, sanitary officials and the public generally have changed with respect to plumbing, and the plumber, always in the advance in these great interests, was ready to meet the higher obligations and demands of his profession. Through the efforts of plumbers the fraternity is being freed from the bad effects of the incompetent, and have to a great extent surrounded themselves with a penal code, rendering work performed not up to the established standard an act punishable by fine. They have at all times taken the lead in matters which have resulted in material good to the public in the promotion of public health.

I remember, when I was Chief Inspector of the Health Department of Chicago, that it dawned on me that the houses erected ten years ago in that city were not in a sanitary condition. Their plumbing was unventilated, old fixtures were in place, and everything in them from the sewer to the water-pipes were in a filthy and choked condition. Sewer air could easily enter the rooms of most houses then built, and in several it had made its entrance felt to a fatal degree. But why had come this change? Why were the new houses going up in Chicago so changed in their internal arrangements and made so nearly hygienic so far as the plumbing was concerned? There had been a great growth. Every man in the plumber's trade who betook upon himself the advancement of his trade had done something. The word went forth that the houses were not in a sanitary condition, that they lacked proper plumbing, and that they were the ones looked upon to furnish a proper plan of sanitary plumbing. Step by step the progress was made. Round by round the hights were climbed, until to-day in almost all of our cities there is the plumber, and there is the material ready to arrange any man's house in accordance with the latest and best advices of sanitary science. We are not going back over this ground again. We have traveled it and, but now, having got out of it into the clearer lights of intellectual handiwork, we propose to keep plumbing up to its highest marks of excellence. If the next ten years make the progress the last ten have in the plumbing trade, we propose to keep right along with it, up with it, doing the work as inventive skill may mark it out for us to do. But I do not expect to see the manner of ventilation, which has done so much for the hygienic arrangement of houses, set aside for any other means. It has come with other good plumbing arrangements to stay and to keep the plumbing in the houses fresh and sweet—to keep the sewer air in its proper place, and take it out upon the top of the houses, and to keep every fixture of the best class that inventive genius can produce.

I will not take up time in asking what you have done. Your work speaks all along your path. You have had no easy way, for opposition is met with everywhere. We have not all the plumbers with us, nor have you all the physicians with you. But we have both enough thoroughly imbued with the great plan of preventive medicine, that we can now begin to talk of the relations of the plumbers and the physicians. I do not believe you think that we are of no concern to you in your work. If I did, this would not be written. But as I have been for the past two years delivering lectures before the Chicago Medical College on the subject of house plumbing and drainage, I find that the subject is one of great interest to them, and the kind invitation I received to deliver this, makes me know that we stand in close relations, and that we might make them closer without the possibility of doing any harm, but a great deal of good. There are many ways in which the plumber could be of a benefit to you without infringing on your labors or on your profession. When you have a case of sickness on hand, and it is not clearly defined, let it be the first thing you do to get a proper plumber to inspect the house and see if it is in a strictly hygienic condition. I say, let a plumber do this for then it will be done correctly. It is his business to know when the plumbing is done properly. Whenever you are called in to see a patient, unless you are quite sure that the house is in an entirely sanitary arrangement, get a plumber to do the inspecting, and he will soon tell you whether it is all right or not. It is a sad case to see what I have seen in this city. The physician working hard, with all his energy, on people whom he could not tell what was the matter with them, and fearing for their safety. The plumber would go into the house, inspect it and tell the doctor that the house was in a most wretched sanitary condition. The patient was removed and in time would get well. But it is a slow process where he is filled with poisons until he has to go to bed with it. When the poison gets that far along with a man he is in too critical a place to prevent all being done that could be done for him. If then the plumber is called in and finds the place unhygienic, it will be but a little spell to remove the patient into sanitary quarters. It is certainly not asking too much of you to ask you to do this. Many lives may be saved by it, and many long hours of pain prevented by it. The plumber will not tell you what to do with your patients when they are found in unhygienic places. He presumes you know what to do, as you do, but let me impress it upon your minds to-day that you have the houses inspected by the plumber, and make yourself sure it is all right, or that the plumbing is out of repair. Do not depend on your own inspection unless you are a plumber and know you understand the system of to-day. I may be pardoned for believing in every man to his trade. It is a good rule to work on, and I have found it out to my heart's content. You are no plumber. You are a physician and follow that as a profession. No plumber lies in bed sick without sending for you. You are his first thought. When he is laid up from his labors, and when you call to see him, have his house inspected by another plumber. Do not rest satisfied until you are thoroughly convinced that the house in which you have a patient is in a thoroughly sanitary condition. If not, get to work getting it in such a condition as soon as you can. Let the plumber who has discovered its defects set about them and straighten them up. It may not be more than a leak or so, but that may be enough to take your patient off despite all you can do. The curative method is sometimes simple, and the simpler it is the better. If the man needs fresh, pure air, let him have it. Let the foul air of his room out and the pure, sweet air in.

The sewers of a house must have lungs to breathe through or they will breathe in every room in the house. The method of ventilating them will furnish them with breathing power, and all the time they will have fresh air going up and down the stack. It was a wise provision when in the plumbing system it was found that ventilation pipes could be constructed so that fresh air would be ready at any fixture, so that when it operated it would flush the system to the sewer, and then stand open for the sewer to breathe through. Who should know when this is done right if not the plumber? Who is skilled in this work, better qualified to judge than the man who has followed it all his life? I am probably wrong, but I will risk the plumber many times over any other person I know, and when he gives me his investigations I can accept them as being correct.

Protective medicine will not be secured alone, but by the cooperation of the plumber. The plumber has it in his hands to make dwellings unsafe for man, or so that he cannot live in them at all. Should the plumber be so determined there is a great

amount of mischief which he could do, and no one be the wiser. But the day is past for that. It is his highest duty to study his work and make improvements upon it. When he does not come up to his highest ideal of his class of work, let him study it until his ideal is reached, and all will be well.

If the 5,000 cases of typhoid fever in Chicago, or any other filth disease, were taken as a case, let it be borne in mind that every mutilated sewer system is directly in communication with where the diseases are prevalent. In many cases imperfect connection with ice-boxes brings the food of the family in direct communication with the gases from the street and house drains. That sickness should result is not to be wondered at. Every agency for its growth is thrown open, and if it does not go forth to bring down its victims, something is entirely wrong.

Nor can all architects be trusted in this most important matter of home drainage, by reason of their lack of knowledge of this most essential service. Taken in consideration the imperfect work devised, superintended and accepted by them in the past, would give but little hope for the future, save in the employment of the practical man, skilled in his profession.

There is one particular in which I might ask you to give us your aid. These cities, many of them, cannot be inspected in regard to their drainage and plumbing as they now are. They stand without laws regarding this, and it is our desire to have laws passed giving us the right to inspect them. In this you can aid us. The family physician, his word is potent in the house. What the patient shall eat, drink or wear is at his dictum. And while advice from the plumber might be looked upon by the owner as having a selfish bearing, a word of the medical man as to an improvement of the sanitary condition of the house, would be unquestioned and his advice readily complied with on the part of the owner. So that co-operation on part of the gentlemen of the medical profession will do wonders in the great cause of preventive medicine.

CONVENIENT TO HAVE ABOUT.

Zinc is best cleaned with hot soapy water, then polished with kerosene.

An Austrian engineer, Herr Reinhofer, recommends crystallized soda dissolved in water to make Portland cement proof against freezing. In one experiment he used 1 litre of Portland cement to 1 litre of lime and 3 of silver sand. He mixed this with 1 kilometer of soda, dissolved in 3 litres of water. The mortar thus made was exposed for 14½ hours to cold of a maximum intensity of 31.5 deg. C., and was then put into a furnace for three hours. At the end of that time the "set" of the cement was found to be perfect.

It is an almost universal notion that a spring which issues from the earth "of its own accord," and which generally looks crystal clear, must be pure; but, though the water has been filtered by passing down through a stratum of earth, it must be remembered that there are two hundred and fifty times as much carbonic acid in the soil as there are in the air, and that the water becomes aerated with it, and that this aids in dissolving various substances and consequently springs come to have a great variety of chemical constituents in widely varying amounts. The strata through which water passes determine its purity or impurity, and the same want of sanitary care that would contaminate a well, will just as surely pollute a spring. Typhoid fever has been directly traced to contaminated springs.

Having planned to give the rooms the life-giving light, see to it that every one which is to be occupied at night is opened so as to get an unobstructed flood of it during the sunniest part of the day. The murmur comes back, "It will fade your carpets." Very likely, but carpets were made for people and not people for carpets, and any right-minded mother would prefer to see the roses on her children's cheeks than on her carpets, when it comes to a choice between them. There are many houses, occupied by people too busy to use a parlor, where the sunniest corner is occupied by an unopened, unused "best room," which is only the survival of a traditional belief that no house is complete without one. The interest of the money on the carpet and furniture would pay for the services of a stout maid during many of the severest weeks of the year; the room is the expression of a yearning for and a dream of leisure that never comes; far better have the reality of aid to lighten household duties that are much too heavy in all the newer and poorer sections of our land.

THE SMOKE NUISANCE.

BY ANDREW YOUNG.

Last week we had somewhat to say about abating the smoke nuisance in smaller cities. We meant by smaller towns and cities those in which the size, or the size of their manufacture, did not make them much of smoke producers. This week we will consider those which have advanced to that extent of being smoke producers to a very great degree, and which are making unhealthful the air and unwholesome appearing everything about them. In these we will usually find officials whose duties are to abate the smoke nuisance. In the city ordinance, clear cut and analyzed down to its roots, it is found plainly to be his duty to abate this most noxious nuisance.

Now we will conclude that the laws are made to cover all this and that the officer has been elected and all are bearing their share of expense in order that the laws may be fully carried out and the smoke stopped. Let us supppse further that this officer is a proper man, one with the full sense of his duties upon him, and bound to discharge those duties whatever it costs. Then, so far as the people are concerned, the work is done, but alas! not so far as the chief smoke inspector. He has before him a long, hard, difficult work. He meets men now in a different way to what he did, and he finds them different. His business with them is in a different channel now and they are not so cordial as they were. Of some this remark is not true. Some there are who will fall right in and will do all they can to help such a man, and a right good help they are. These are our heroes and how I would rejoice to see them crowned amid the affections of their people for their patriotism, for their pride and love of their cities, and for all that goes to make up our good citizens! But there are those who will wish this official many a sad mishap before he gets through with them.

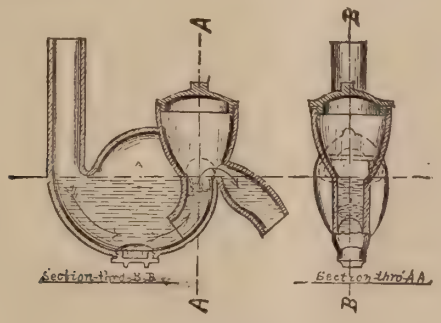
Here is where he will find his work and here it is he will find he will have to work if he expects to accomplish anything. He first notifies those who are making smoke that it is contrary to law, and that they are expected to stop it by a certain time. This notice is served usually by mail, sometimes by bearer, but it is always safe to conclude that the notice has been served. Then there will be found out what there is in men. You can tell what constitutes the man by serving a notice on him to stop making smoke quicker than in any other way. You will find some men will come right to the official and ask him what he knows of devices, etc., and take his advice, and in as soon a time as he can get the device to work he is making no more smoke. This is your hero, your good patriot and the one of your very best citizens. When your city needs any helping hand you can speak to him of it, and know you will always get a kindly help. He is the man who makes cities and nations grow, and he is the one who does many a good turn for a poor fellowman and no one knows anything about it.

But this man is not the one to consider. Were they all like this one we would need no smoke inspector. But the inspector finds his work in taking care of those who do not wish to obey his notice, and do not seem inclined to try. A suit is brought against these, they are found guilty and fined in accordance with the city ordinance. They paid that fine, made low for the first, and go ahead making as much smoke as before, disregarding the notification, the law and everything. Here the court may seem to be favoring a man by fining him light the first time, just enough to call his attention to the fact that he is violating the law. If a man is not aware of that fact after he has been served with notice that he is violating the law, I must confess that I know of no other way of making him acquainted with it. There should be no little make-believe things in regard to such a thing as a smoke nuisance. It is no little thing in itself I can assure you and here you find the man who was assessed his little fine ready for another. The first has been just thrown away, and where no promise to supply a preventor is made or nothing said about preventing the smoke, you place a small fine on in order to get another pull at him in the near future. Let these men know you are not fooling with them, that you are not playing with them, but let them understand and know from the beginning that you mean business—

just square business—that and nothing more and nothing less. It will take a man with considerable nerve about him, but that is the kind of man we are considering at the present. He must not give an inch, be a gentleman, but give the smoke producers to understand that they have to stop producing smoke. Let them know that the city law and all its officials are behind him ready to see that it is fully and perfectly enforced, and that they have to obey its demands. Let the courts stand right by the smoke official, fine them to the fullest extent of the law every time they get a chance, and see how long these men will be producing smoke, or working so indifferent to it. It is much in the man who has the law to enforce and the manner he goes about it. If he is business square through, and is known never to take "no" for an answer, he will find his work not light, but much easier than if he were like the one we will speak of next week.

THE E. E. SCOTT PATENT TRAP.

The accompanying cuts represent an entirely new form of trap with a ball. The inventor, Mr. E. E. Scott, a practical plumber of fifteen years' experience, has, for the past eighteen months, had many of these traps working in some of the most trying places for a trap, and has yet to hear the first complaint of them either on account of siphonic action or because of their becoming stopped up.



The trap is the result of the ripe experience and careful study of the subject by the inventor. It is found that many traps, particularly the lead trap, have the inlet and outlet so close together and such a small amount of water, that they are very easy to stop up, and siphon very easily, even when vented. When the distance is considerable from the trap to the outer end of the vent pipe this tendency to siphonic action is very great. The expense of venting all small traps in a house is so great as to prevent its general adoption. Moreover it is not at all reliable. We need no better evidence of this fact than the constant discussion in the trade journals as to the proper point in the trap to vent from in order to avoid stoppage. It has been the practice, until within a year or two, to vent from the crown. Now this is changed and the vent is put in below the crown, and even there it is impossible to prevent it from getting stopped up. Venting also causes more empty traps from evaporation. In certain favorable conditions of the air the water will entirely disappear from a ventilated trap in a surprisingly short time. When water alone is relied upon to seal the trap, it frequently becomes foul and causes bad odors in an apartment, by reason of the gradual permeation of the sewer gas through the water contained in the trap. These difficulties are obviated in the Scott trap by the use of the non-corrosive ball having its seat at the outlet and separating the sewer gas from the water thus keeping the latter as pure as when it entered the trap. By this construction the necessity of a ventilating pipe is entirely avoided.

Again the conformation of this trap is such as to avoid the very serious objections to those traps having a large round body with inlet at the bottom and outlet at the top. It is well known to the trade that such traps cannot clear themselves and are sure to soon fill up with constant accretions of sediment besides being subject to the same objections as the traps previously referred to. In some traps the water is discharged directly on top of the sediment in the body of the trap and consequently instead of stirring it up, packs the sediment down continually until it clogs up the trap so it will not work at all. This difficulty is obviated in the Scott Trap. It combines all the well known advantages of the "S" trap with those of a trap having a ball to seal the outlet against the escape of sewer gas and has a perfect water seal besides. The large air chamber in the body of the trap over the water, and so near the inlet, reduces to the minimum the chance of siphonic action. It is contended by some that the ball trap is more apt to clog and fill up than a trap without a ball, but our experience teaches us that a ball trap is much less liable to clog than the ordinary lead trap. Moreover the Scott trap can be used without the ball and will then form a much more reliable trap than the "S" or any common trap. Among other advantages claimed for it are the following:

The construction is such that a direct pressure is secured from the inlet to the outlet without any constructions or sharp turns, thus obviating any chance for the lodgment of sediment or the collection of lint or other substance to obstruct the passage. The bottom is the same size as connecting pipes and the sides convex, making it the best trap to scour and clear itself now on the market.

It is sealed at the outlet when not in operation by a non-corrosive ball, which, when the trap is in operation is kept in motion by the water and prevents anything from collecting on the inner side of the ball chamber. The outlet does not project so far into the trap as to allow the sediment to miss the outlet and clog above it or around the inlet, as is the case with most other traps. In this the direct pressure obtained through the body of the trap, which has the air chamber above the water line, thoroughly cleansing it whenever flushed, and carries all refuse matter up under the ball into the outlet.

It remains securely sealed at all times, whether it contains water or not, because when not in operation the ball must rest securely in its seat, effectually closing it against the escape of sewer gas.

The mouth of the outlet pipe leading out of the ball chamber is oblong, having its greatest diameter in a horizontal plan and a capacity equal to the inlet, and hence much less pressure is required to raise the ball far enough to allow the water to escape than in other traps having the mouth of the outlet pipe round.

East Saginaw, Mich. E. E. Scott & Co.

QUESTION OF THE LOWEST BID.

William H. Sayward, Secretary of the National Association of Master Builders, in *Carpentery and Building*, says: The recent decision of a case in the Massachusetts courts where a verdict was given the plaintiff, a contractor, on his suit to recover damages because he had been deprived of a contract for which he was the lowest bidder deserves particular comment, to bring to the minds of all members of the National Association of Builders and the building fraternity generally certain facts in law affecting certain customs prevalent in the submission of bids. A *resume* of the case was presented in the October issue of this paper, and the mid-year meeting of the Board of Directors of the National Association ordered the distribution of a large number of copies of this statement for the information of filial bodies and all persons interested.

The trial of the case develeped a certain fact which should be carefully noted by all contractors as seriously affecting their interests—viz.: Although bidders may be selected and specially invited to estimate upon certain work, no bidder has a claim upon the contract by virtue of furnishing the lowest bid unless there be a special agreement to the effect that if the contemplated work is undertaken substantially as presented the contract shall be awarded to the lowest bidder. This agreement need not be in writing, but if verbal must be capable of proof. The introduction of the familiar clause "The owner reserves the right to reject any or all bids" does not hold against bidders if an agreement such as cited above, and upon which the decision of this particular case rested, has been made. The trial and decision of this case should awaken all contractors to the fact that if they wish to protect and insure themselves against loss of time in estimating and being deprived of possible profits upon work won in competition, they should be careful to secure an agreement of the nature above referred to. It is worthy of consideration whether, when bidders are selected and invited to offer estimates and are expected to hold themselves ready to contract for the work at the price submitted, there is any justice in the use and enforcement of the clause, "the owner reserves the right to reject any or all bids."

The owner has unquestionably the right to reject all bids, for the estimate may exceed the amount he is at liberty to expend, but it seems most unreasonable for him to reject any particular one of the bidders after having invited him to submit an estimate. The invitation to bid carries the inference that the person invited is considered a fit person to do the work, and unless there be particular stipulation that a preference will be made in favor of one of the invited bidders, so that all may know in advance the conditions affecting the awarding of the contract, it is manifestly unfair and unjust to throw out the person who has won the competition, on the plea that the owner has reserved the right to reject any bid. It would seem that a different wording should be used in cases where all the bidders are selected, so that it would be clearly stated that if any of the bids were accepted it should be the lowest bid.

There is manifestly a great deal of obscurity in the minds of contractors generally as to their true relation as bidders, and this trial is of great value in settling certain points. The duty of the National Association of Builders is to disseminate the information so that the greatest good to the greatest number may be secured. It is to be hoped that filial bodies will take particular pains to discuss the questions brought into prominence by this trial, as it will more than likely be a topic for discussion at the annual convention in January, in the hope that a broader and fuller comprehension of contractors' rights and relations may result.

DEATH OF JOSEPH A. MACDONALD.

The Master Plumbers' Association, of Boston and vicinity, met at Elks Hall, Boston, Oct. 28, 1891, and adopted the following resolutions:

Whereas, The Master Plumbers' Association, of Boston and vicinity in memorial meeting assembled, having learned of the sudden decease of our National President, Joseph A. Macdonald, whom God in his infinite wisdom has removed from our midst, to his long earned rest, we bow in submission to his will; be it therefore

Resolved, That by his death this association has lost a true and earnest worker, one whose heart and feeling were for the elevation of the trade and members.

Resolved, That we have lost a guide and wise counsellor in all our deliberations, a steadfast adherent to principle, and the faithful observance of every manly virtue, he will always be remembered by those who knew him as a noble gentleman.

Resolved, That we tender our heartfelt sympathies to the family and friends of our deceased brother, and pray that God will sustain them in their bereavement.

Resolved, That a copy of these resolutions be spread upon our records, and a copy engrossed and sent to the afflicted family.

Thomas J. Tute,
Daniel G. Finnerty,
D. A. Horgan,
W. A. Daly,
Committee on Resolutions.

ESTIMATES OF COST AND PROFIT ON WORK.

In large operations one of the most difficult things to arrive at is an estimate of the cost of the work; and if this is true of ordinary operations, it is also true of those where the character of the work is extraordinary. It does not answer for men to pride themselves upon their experience in such cases, for the most astute can err at times on estimates. In fact, this matter of arriving at costs is just the difference between success and failure in trade. The greatest leak is in time, few knowing how much waste or how much to allow for ordinary jobs. Experts are as liable to make mistakes as those who have had little experience, for they naturally feel that others can do work as quickly as they can. A very safe guide is the time book, if the same is properly kept, or so that it can be read like a chart; the average time in this record is a safe criterion. Another stumbling block in the way of costs is defective material, and time lost in replacing it. In all operations unforeseen losses occur in this direction, and while it is as easy to get foundrymen to replace bad castings, it is very difficult to make them pay for labor on them. At least five per cent. allowance should be made for lost work. A great many manufacturers simply consider the cost of the material and wages in doing work, adding to these a certain amount, from forty to fifty per cent. generally, for the shop, as the saying is. This includes interest, wear and tear on tools, interest or rent, as the case may be, and the profit. This last, let us say, is certain to dwindle to a small percentage under such conditions. The net profit, in any event, is that earned by the amount of capital employed to produce it. If a firm has $100,000 in trade, and only one-half of it is actually in the work going forward, all profit which accrues is earned by $50,000; the remaining $50,000 is only entitled to the amount it would earn if put out at interest.—*The Engineer, N. Y. City.*

FOR THE DIGESTION.

In bread-making, as in baseball, there is nothing like a good batter in the hour of knead.—*Binghamton Leader.*

Cora—"Did you ever go to a fortune-teller's?" Merritt—"Yes, my dear. I went to Bradstreet's to find out about your father's fortune."—*Epoch.*

Jack—"Well, Jim, I proposed to Miss Summer last night." Jim—"Did she give you her heart?" "No; but I got a piece of her mind."—*Yale Record.*

Foreman—"They say old Jones is dying by degrees." Editor—"Just like him. He never will hustle when he strikes a good thing."—*Atlanta Constitution.*

Watts—"O, yes, soap and civilization go hand in hand." Potts—"Guess you are right. As a scenter of civilization the soap factory is an undoubted success."—*Indianapolis Journal.*

Men are most likely to rave about a woman's hair when it is found in the butter.—*Texas Siftings.*

Clara (at the Simpkins' grand hop)—"Didn't Miss Muslin's ball-dress reach her in time to-day?" Maud—"I believe so." Clara—"Then how does it happen that she isn't here?" Maud—"It came C. O. D."—*Cloak Review.*

The world is full of people who will wish on the judgment day that copper money had never been invented.—*Ram's Horn.*

Binnick—"Do you think it is possible that some men weep for joy at times?" Cynic—"Yes, when the joy is some one else's."—*New York Herald.*

Brown—"I'm like ivy. I cling to my church." Fogg—"Very like ivy. Confine yourself to the outside of the church."—*Boston Transcript.*

Merchant—"Have you no trade?" Tramp—"Trade! No, sir; but I have a profession. I am a special pleader at the bar."—*Baltimore American.*

No one ever entertained an angel unawares. Angels always announce their angelship. It is the devils who are entertained unbeknown to their hosts.—*Atchison Globe.*

I cannot understand why you should claim that Madge Flyppe is such an artless creature. She strkes me as rather knowing." "That's just it. She is not knowing enough to conceal what she knows."—*Indianapolis Journal.*

"Mr. Upholsterer, I would like to buy a nice reception chair. Something new." "We have just the thing, madam. Here it is. Made especially for our trade. Take a seat on it." "Dear me! Why, this chair is awful! I couldn't sit on it five minutes. I never sat on such an uncomfortable thing in my life!" "Exactly, madam. That is just the idea. You see it is made for callers."—*Harper's Bazar.*

Friend—"I saw some of your jokes in a book." Humorist (flattered)—"Ah, what book was that?" Friend—"I forgot the name. It was a book published a hundred years ago. I saw it in a second-hand book-store."—*Yankee Blade.*

Every man who does not labor and lay up a fortune may cause absolute suffering to his daughter's future husband.—*Elmira Gazette.*

"Binx's conscience is a pretty unsteady affair," said one young man about town to another. "Yes," was the reply; "it seems to have a load on it most of the time."—*Washington Star.*

Doctor—"You noticed a marked increase in your appetite?" Patient—"Yes." Doctor—"Sleep longer and more heavily than usual?" Patient—"Yes." Doctor—"Feel very fatigued after much exercise?" Patient—"Yes." Doctor—"H'm! Very grave case. But the researches of science, sir, enable us to cope with

your malady, and I think I can pull you through."—*Harper's Bazar.*

STEWART CERAMIC COMPANY.

The Stewart Ceramic Company announce that they have secured the services of a competent salesman, who will devote his entire attention ro canvassing the trade in the interest of their line of Solid White Crockery laundry tubs and sinks, feeling confident that this increase in attention to the wants and demands of the resident plumbers will insure a corresponding increase in business.

We are in receipt of their new hanging sign of cardboard, embossed in silver and gilt, which they have lately sent out to each of the master plumbers in this city. This is a beautiful card to hang up in any store room or any place where it may be seen. It is neat, and not a large, gaudy board which would make one tired to be compelled to look upon it every day. The letters are in silver, and a wash tub and sink are in gold, the wash tub being at one end of the card and the sink at the other, leaving space for the letters across the top, down the middle and across the bottom. When you get one you will pronounce it beautiful, and it will take but a short time to read the letters that are on it.

Their neat and forcible cards are also now appearing in the horse-cars, a somewhat new and novel field, as well as expensive. It will doubtless result in great advantage to the trade, however, by calling the attention of the consumer to the advantages of a high grade of goods.

Their new catalogue is well under way, and will be out in the course of a few weeks. The office and showroom of the company is located at 323-25 Dearborn street and 62 Plymouth Place.

CONTRACTING NEWS.

WHERE NEW WORK WILL BE DONE.

New York City, N. Y.: French, Dixon & DeSaldern have planned alterations to cost $175,000 for a building on Lenox ave., converting it to a hotel. O. Wirz has planned for a $200,000 building at 39-41 Cortlandt street. Thorn & Wilson have planned a flat building to be erected at the corner of Columbia ave. and 92nd street, to cost $60,000. The Children's Aid Society will erect a brick school at 219-221 Sullivan street. Name & Radford are the Architects. A. C. True has planned seven stone dwellings to be erected on West End ave. and 77th street, to cost $118,000.——Brooklyn, N. Y.: T. Engelhardt has planned a brick brewery to be erected by C. Heinbockel & Co., at 70 E. Hamburg street, to cost $13,000; also a beer store house to cost $20,000 for the same firm.——Avondale, Ill.: A. Druiding, of Chicago, has planned the Catholic church school to be erected here; cost, $10,000.——Aurora, Ill.: T. N. Bell has planned a 4-story stone and office building to be erected by Congressman W. H. Hopkins.——Cincinnati, O.: Samuel Hannaford & Sons have been instructed to prepare the plans for a 7-story building on the corner of 4th and Elm streets, where the Burkhardt building formerly stood. Wm. Hooper, Frank Jones and Lewis Seasongood are the owners, and the building will cost about $200,000.——Crapsey & Brown will prepare the plans for a new 12-room school house at Lebanon, O. The building will cost $40,000.——Detroit, Mich.: A. C. Varney & Co. have planned a 2-story manufacturing building for the Detroit Stay Co.; cost, $7,000.——Utica, N. Y.: Jacob Aque has planned a $20,000 building for the Mannerchor society.——Chicago, Ill.: H. S. Robbins has plans for a brick store and flat building to be erected at 5633 Jefferson ave. by H. S. Robbins; cost, $40,000. Henry Ives Cobb has planned a dwelling to be built by Robbins & Vilas at 2932-34 Indiana ave., at a cost of $20,000. Edbrooke & Burnham have planned a brick dwelling for A. H. Shepard to be built at 3349-51 Michigan ave.; cost, $60,000. The Industrial bank building will be erected at the corner of Blue Island ave. and Laflin street, after plans by W. Dykeman & Son; cost, $25,000.——Newark, N. J.: The Turnverein contemplates the erection of a suitable building. Max Sachs is president of the society.

HEATING AND LIGHTING.

The following electric light companies have been recently incorporated: Crouch-Houston Electrical & Mfg Co., of Eugene, Ore.; to manufacture the Crouch safety dynamo; F. H. Crouch, of Eugene; $1,000,000. New York Electric Construction Co., of Jersey City, N. J.; John H. Hapgood, P. V. Vermilyea and Geo. E. Hutchinson; $100,000. Union County Electric Co., Roselle, N. J.; H. P. Baldwin, of Roselle; H. M. Byllesby, of St. Paul, Minn.; W. H. Moore, Plainfield, N. J.; $30,000.——Kirksville, Mo.: It is proposed to issue $38,000 in bonds for electric lighting.—— Seattle, Wash.: It is proposed so spend $30,000 on an electric light plant.——Washington, N. C.: Caleb Stirling is about to erect an electric lighting plant at this place.——Radford, Va.: This place is to have electric light works. Address H. P. Briggs for particulars.——Port Huron, Mich.: The Port Huron Fuel, Gas and Light Co. was organized in this city, October 22, with a capital of $30,000. Among the incorporators are Chas. A. Bailey and H. W. Stevens, of this city.——Windsor, Ont.: Willis C. Turner has organized a company for the purpose of establishing an incandescent light system.——Braintree, Mass.: A town meeting has been called to see if the town will vote to establish an electric lighting plant.

SEWERAGE NOTES.

Rochester, N. H.: A sewerage system to cost $125,000 will be designed, but probably but a portion only will be built now, and the remainder from year to year.——Hanover, N. H.: Surveys are being made for a system of sewers.——Meriden, Conn.: C. P. Bassett, assisted by T. H. McKenzie, will prepare plans for a sewerage system.——Silver Creek, N. Y.: A sewerage system is projected.——Harrisburg, Pa.: A sewer in the Sixth Ward, on Muench street, is proposed.——Bellefonte, Pa.: A system of sewers is proposed.——South Scranton, Pa.: A sewer is proposed for the South Side.——Bowling Green, Ky.: A report upon the advisability of a sewerage system has been made.——Cedartown, Ga.: Plans for the new sewerage system are being prepared by Hartford, Herbert & Co., of Chattanooga, Tenn.——Little Rock, Ark.: Plans are to be prepared for a complete system of sewerage.——Oregon City, Ore.: An ordinance has been prepared for a system of sewerage and plans have been made by the city engineer.——Fairhaven, Wash.: A petition has been presented for sewerage for North Fairhaven.

WATER WORKS NOTES.

Medical Lake, Wash.: In November, a vote will be taken on issuing $13,000 of bonds for works.——Pendleton, Ore.: An additional supply is talked of.—— Portland, Ore.: The Albina Water Co., which supplies the former town of Albina, has contracted to extend a 6-inch main to the Willamette Tract.——Berkeley, Cal.: It is reported that the State University Regents propose to condemn land for a storage reservoir, and that a tunnel will be driven.——Lyndon Centre, Vt.: A supply from a spring about 3,600 feet above the village is being talked of. Company ownership is mentioned.——St. Albans, Vt.: The sum of $85,000 was voted Oct. 25th for an increased supply, in accordance with recommendations by L. A. Taylor, Boston. A large storage reservoir will be built.——Brookline, Mass.: An appropriation of $9,000 has been voted for new mains.——Clinton, Mass,: The water board has been authorized to issue $10,000 of bonds for improvements.——Brigham City, Utah: Hyram House, of Corrinne, is trying to secure a franchise, or else a contract for building works to be owned by the city.——Belleville, Ill.: Preliminary surveys are being made for a supply from Kaskaskia River, 14 miles distant.——Galva, Ill.: It is reported that works will be built.——Quincy, Ill.: Nov. 17th the people will vote on building works. MacRitchie & Nichols, Chicago, have reported on works estimated to cost $620,000. The city is now supplied by a company between which and the city there are disagreements.——Ashland, Wis.: The company's capital stock will be increased.——New Iberia, La.: Works are projected.——Morristown, Tenn.: It is reported as probable that the Morristown Water-Works Co. will soon begin to build works.——Cloverport, Ky.: The people are trying to secure works.——Ludlow, Ky.: A committee has been appointed to report at a citizens' meeting, to be held on Nov 4th, on securing a water supply.——Radford, Va.: H. P. Briggs, councilman, is offering for sale bonds of the eastern section of the city to establish water-works and electric lights in that section. Part of the city, at least, is now supplied by a company.——Salem, Va.: Surveys are being made by the Development Co. for a supply from the Griffin Spring.—Mannington, W. V.: The agitation for works

still continues.——Buena Vista, Ga.: The city has secured authority to build works.——Cedartown, Ga.: Plans for works are being made by Hartford, Hebert & Co., Chattanooga. Bonds have been voted.——Elgin, Tex.: C. A. King, Mayor, informs us that the city will let a contract about Dec. 1st for works estimated to cost $10,000. The supply will be pumped from wells to standpipe. Population, 1,200.——Helena, Ark.: The Helena Water Co. has been incorporated with a full paid-up capital stock of $100,000. The officers are: President. M. P. Hillyer; Secretary, W. M. Neal: Treasurer, T. A. Straws.——Dayton, O.: Wells are to be added and an additional suction pipe laid.——Muncie, Ind.: The company has offered to extend its mains three miles. No action has been taken by the council.——Washington, D. C.: Capt. J. L. Lusk has recommended the appropriation of $100,000 for a new high service system.——Cape Girardeau, Mo.: It is reported that works will be built.——Montrose, Pa.: Works are still projected.

BIDS AND CONTRACTS.

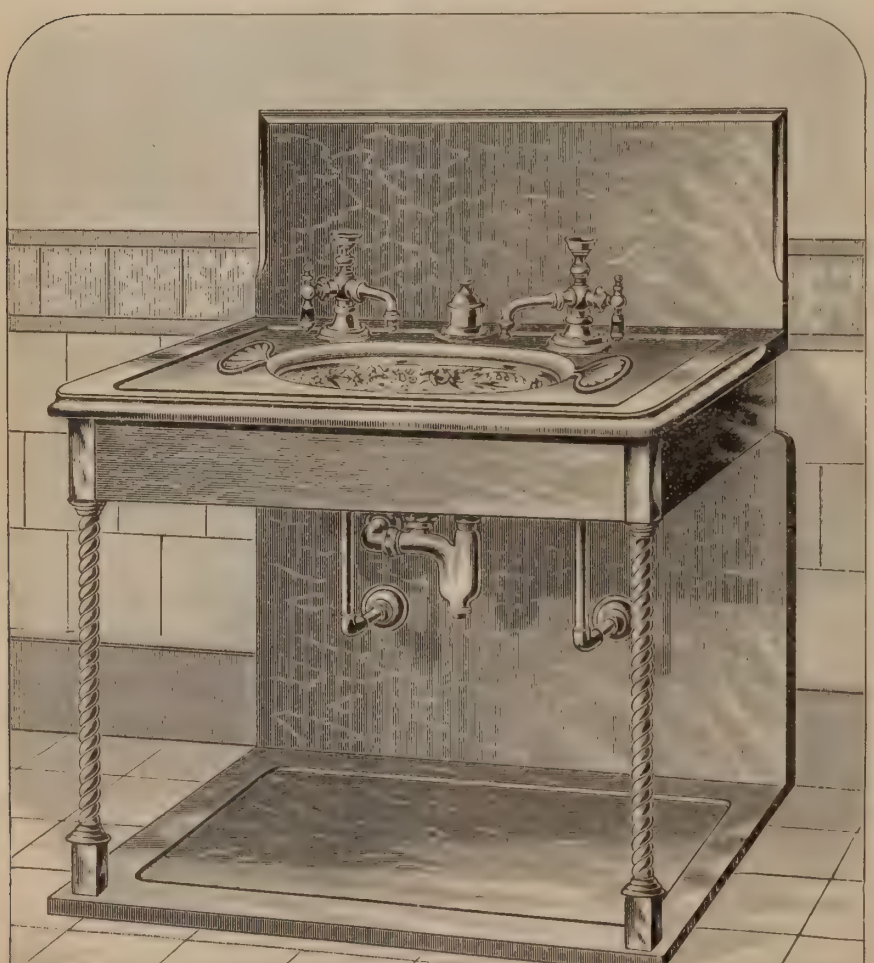
San Rafael, Cal.: Proposals are wanted until Nov. 10, for the construction of a 50,000-gallon water tank. Address the clerk of the Board of Marion county supervisors.——Vicksburg, Miss.: Proposals are wanted until Dec. 7, for public lighting, by gas or electricity. Address Mayor R. V. Booth, as above.——Montreal, Canada: Proposals are wanted until Nov. 11, for the construction of certain sewers at this place. Address the city clerk as above.——Savannah, Ga.: Proposals are wanted until Nov. 23, for furnishing a number of water gates, 60,000 pounds of lead, suitable for laying water pipes; also for the erection of a pumping station. Address James Manning, superintendent of water works, as above.——Cleveland, O.: Proposals are wanted until Nov. 25, for certain public lighting at this place. Address R. R. Herrick, director of public works, as above.——Lansingburg, N. Y.: Proposals are wanted until Nov. 9, for the construction of main and other sewers. Address W. S. Franklin, engineer, as above.——Dallas, Tex.: Proposals are wanted until Nov. 15, for the constraction of a system of water works. Address the city clerk, as above.——Blakely, Ga.: Proposals are wanted until Nov. 9, for the erection of a college building. Address G. D. Oliver, as above.——New Berne, N. C.: Proposals are wanted, no date specified, for the construction of a system of water works. Address W. D. Wallace, as above.——San Bernardino, Cal.: Proposals are wanted until Dec. 9, for the erection of a county jail. Address Architect Charles H. Jones, as above.——Fort Worth, Tex.: The time for receiving bids for the new city works has been extended from Oct. 19 to Nov. 15.——Henrietta, Tex.: Bids for building works are wanted. Address H. J. Strickfadden, city secretary.

FLORIDA AND THE SUNNY SOUTH VIA THE BIG FOUR ROUTE.

To all persons contemplating a southern trip, the Big Four Route offers special attractions and advantages possessed by no other line. Solid Vestibuled trains, heated with steam and equipped with palace sleeping cars, reclining chair cars and elegant parlor cafe dining cars run daily, making connection in Central Union Station, Cincinnati, with through express trains of the Queen & Crescent Route, Louisville & Nashville, Kentucky Central and Chesapeake & Ohio Railways, avoiding the tedious transfer necessary via other lines, and affording practically through train service to Old Point Comfort, Asheville, Chattanooga, New Orleans, Savannah, Jacksonville, St. Augustine, Tampa, Indian River, and all winter resorts of the South. Tourist tickets via the Popular Big Four Route at special low rates are on sale at all coupon ticket offices throughout the country. Ask the agent for tickets via the Big Four Route. J. C. Tucker, G. N. A., 234 Clark street, Chicago. D. B. Martin, General Passenger and Ticket Agent, Cincinnati, Ohio.

The hugest articles in the culinary line are to be found in the kitchen of the Bon Marche in Paris. Among the articles enumerated are kettles, the smallest holding 75 quarts, and the largest 375. Even the frying-pans are so large as to be able to cook 300 cutlets in each, and to fry 220 pounds of potatoes.

No. 4.



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